MARTIN MARIETTA

ORNL/ER-210

ENVIRONMENTAL RESTORATION PROGRAM

Data Management Plan and Functional System Design for the Information Management System of the Clinch River Remedial Investigation and Waste Area Grouping 6

ENERGY SYSTEMS

ER

MANAGED BY
MARTIN MARIETTA ENERGY SYSTEMS, INC.
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

UCN-17560 (6 7-91)

CDM Federal Programs Corporation

contributed to the preparation of this document and should not be considered an eligible contractor for its review.

ORNL/ER-210

Data Management Plan and Functional System Design for the Information Management System of the Clinch River Remedial Investigation and Waste Area Grouping 6

This page can be trimmed for use as a spine on a three-ring binder.

ORNL/ER-210

Energy Systems Environmental Restoration Program
ORNL Environmental Restoration Program

Data Management Plan and Functional System Design for the Information Management System of the Clinch River Remedial Investigation and Waste Area Grouping 6

Date Issued—March 1994

Prepared for
U.S. Department of Energy
Office of Environmental Restoration and Waste Management
under budget and reporting code EW 20

OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37831-6285
managed by
MARTIN MARIETTA ENERGY SYSTEMS, INC.
for the
U.S. DEPARTMENT OF ENERGY
under contract DE-AC05-84OR21400

Prepared by
(alphabetical order)

Teri Ball
Craig Brandt
Jim Calfee
Mike Garland
Susan Holladay
Beth Nickle
Denise Schmoyer
Cindy Serbin
Mark Ward

and

CDM Federal Programs Corporation
800 Oak Ridge Turnpike, Suite 500
Oak Ridge, TN 37830

Data Management Plan and Functional System Design for the Clinch River Remedial Investigation (CRRI) and Waste Area Grouping (WAG) 6 Information Management System

Approvals

RB Cook — 12/7/93

R. B. Cook,
CRRI Program Manager — Date

S D Van Hoesen — 12/7/93

S. D. Van Hoesen,
WAG 6 Project Manager — Date

DISCLAIMER

CONTENTS

FIGURES

TABLES

ABBREVIATIONS

APO	Analytical Project Office
ASC	analytical services coordinator
ASG	analytical services group
CASE	Computer-Aided Software Engineering
C&TS	Computing and Telecommunications Services
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLP	Contract Laboratory Program
COC	chain-of-custody
CRRI	Clinch River Remedial Investigation
CSD	computer system design
DC	data coordinator
DEC	data entry clerk
DM	data manager
DMC	document management center
DMP	data management plan
DOE	U. S. Department of Energy
DOT	U. S. Department of Transportation
DQO	data quality objective
DVV	data verifier/validator
E-mail	electronic mail
EPA	U. S. Environmental Protection Agency
ER	environmental restoration
ESD	Environmental Sciences Division
ESTL	Energy Systems Technical Lead
FAS	field activity sheet
FFA	Federal Facilities Agreement
FCOC	field chain-of-custody
FCTM	field collection task map
FSD	functional system design
FSTL	field sampling team leader
FT	field technician
FTM	field task manager
GIS	geographic information system
GPS	Global Positioning System
HP	health physics
IEF®	Information Engineering Facility®
IMG	information management groups
IMS	Information Management System
LC	laboratory coordinator
LCOC	laboratory chain-of-custody
LPTM	laboratory processing task map
LQAP	laboratory quality assurance plan
MOU	Memorandum of Understanding
MPR	monthly progress report

NCR	nonconformance report
OREIS	Oak Ridge Environmental Information System
ORNL	Oak Ridge National Laboratory
ORR	Oak Ridge Reservation
PEC	performance exception coordinator
PER	project exception report
QA	quality assurance
QAAP	quality assurance assessment plan
QAPjP	quality assurance project plan
QC	quality control
RCRA	Resource Conservation and Recovery Act of 1976
RDBMS	relational data base management system
SAP	sampling and analysis plan
SDG	sample delivery group
SDM	systems development methodology
SOW	statement of work
SPARCC	sensitivity, precision, accuracy, representativeness, completeness, and comparability
STL	sampling team leader
TDEC	Tennessee Department of Environment and Conservation
WAG	waste area grouping
WP/EMP	work plan/environmental monitoring plan

ACKNOWLEDGMENTS

The authors acknowledge the following Waste Area Grouping (WAG) 6 and Clinch River Remedial Investigation (CRRI) Information Management Team members for their contributions to the data management plan/functional system design document, including conceptual development, implementation, and technical review: Diane Clark (WAG 6), Clell Ford (CRRI), Dan Levine (CRRI), Susan Madix (CRRI), John Peterman (WAG 6), and Don Watkins (WAG 6). Science Applications International Corporation provided input on data assessment.

The authors thank Robert Connell, Phyllis Sexton, and Linda Treadwell for their help in the preparation of this document.

EXECUTIVE SUMMARY

The Data Management Plan and Functional System Design supports the Clinch River Remedial Investigation (CRRI) and Waste Area Grouping (WAG) 6 Environmental Monitoring Program. The objective of the Data Management Plan and Functional System Design is to provide Organization, integrity, security, traceability, and consistency of the data generate during the CRRI and WAG 6 projects. Proper organization will ensure that the data are consistent with the procedures and requirements of the projects. The Information Management Groups (IMGs) for these two programs face similar challenges and share many common objectives. By teaming together, the IMGs have expedited the development and implementation of a common information management strategy that benefits each program.

1. INTRODUCTION

The information management groups (IMGs) within the Clinch River Remedial Investigation (CRRI) and the Waste Area Grouping (WAG) 6 Environmental Monitoring Program are responsible for the management, integration, and dissemination of data generated by their respective programs. These two groups face similar challenges and share many common objectives. By teaming together, the IMGs are expediting the development and implementation of a common information management strategy that benefits each program.

Background. The Oak Ridge National Laboratory (ORNL), the Oak Ridge Y-12 Plant, and the Oak Ridge K-25 Site are U.S. Department of Energy (DOE) facilities located on the Oak Ridge Reservation (ORR) in eastern Tennessee. Operations and waste disposal activities conducted on the ORR since the early 1940s have resulted in the introduction of a variety of airborne, liquid, and solid wastes to the environment.

The ORR was added to the National Priorities List in December 1989. A Federal Facilities Agreement (FFA) [pursuant to Sect. 120 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 and Sect. 6001 of the Resource Conservation and Recovery Act (RCRA)] between DOE, the U.S. Environmental Protection Agency (EPA) Region IV, and the Tennessee Department of Environment and Conservation (TDEC) went into effect in January 1992. The intent of the FFA is to ensure the coordination of DOE's CERCLA and RCRA response obligations to achieve an effective and comprehensive remediation of releases and threatened releases of hazardous substances, hazardous wastes, pollutants, or contaminants at or from the ORR. The requirements of the National Environmental Policy Act of 1969 are also integrated into corrective action/remedial response actions at DOE facilities pursuant to DOE Notice 5400.4, issued in August 1988.

The CRRI is designed to address the transport, fate, and distribution of waterborne contaminants (e.g., radionuclides, metals, and organic compounds) released from the DOE ORR and to assess potential risks to human health and the environment associated with these potential contaminants. Primary areas of investigation are Melton Hill Reservoir, the Clinch River arm of Watts Bar Reservoir from Melton Hill Dam to the confluence of the Clinch and Tennessee rivers, Poplar Creek, and Watts Barr Reservoir below the mouth of the Clinch River. The contaminants identified in the Clinch River/Watts Barr Reservoir downstream of the ORR are associated with the water, suspended particles, deposited sediments, and aquatic organisms; and they can affect wildlife feeding on aquatic organisms.

WAG 6, located at ORNL, serves as a shallow-burial site for low-level and nonhazardous sanitary wastes. Based on the results of the RCRA Facility Investigation conducted from 1989–1991 and on recent interaction with EPA and TDEC, implementation of source control remedial measures at the WAG was postponed. DOE, EPA, and TDEC have decided to address the risks associated with WAG 6 by maintaining site access controls to prevent public exposure to on-site contaminants and by continued monitoring of contaminant releases to determine whether source control measures will be required in the future. Activities to be conducted during the monitoring program include sampling and analysis of groundwater wells,

surface water, and seeps and springs; monitoring of water-level measurements; and collection and monitoring of meteorological data.

2. SCOPE, OBJECTIVES, AND APPROACH

2.1 SCOPE

The IMGs within the CRRI and WAG 6 projects share similar challenges and have many common objectives. The IMGs have teamed to expedite the development and implementation of a common information management strategy that will benefit each program. This document describes the common data management strategy and system developed by the project IMGs.

2.2 OBJECTIVES

Before field or laboratory activities begin, the project manager prepares a project work plan/environmental monitoring plan (WP/EMP). The WP/EMP provides a framework for the identification of environmental project problems and the actions required to address them. Based on the WP/EMP a quality assurance project plan (QAPjP) is developed. To ensure that the data quality objectives (DQOs) dictated by the intended use of the data are achieved, the QAPJP describes the policy, organization, functional activities, and quality assurance (QA) and quality control (QC) protocols necessary, including laboratory QA and QC. Sampling and analysis plans (SAPs) are also written to provide guidance for all fieldwork by defining in detail the sampling and data gathering methods to be used.

The objective of the Information Management System (IMS) is to provide organization, integrity, security, traceability, and consistency of the data generated during the CRRI and WAG 6 projects as defined in the WP/EMP, QAPjP, and SAPs. Specifically, the IMS will support the project data lifecycle, including field sampling preparation, field measurements, sample tracking, laboratory analyses of environmental samples, data verification and validation, data assessment and evaluation, data consolidation and storage, and data transfer to the Oak Ridge Environmental Information System (OREIS), data analysis and interpretation, spatial analysis and mapping, summarization and reduction of data, support simulations and risk assessment calculations, data presentation, and data and document archival. An IMS user's guide will provide specific instructions for access to the workstation where the IMS will reside, data entry and management of project data via software applications, and retrieval of project data from the IMS data structures.

Proper organization will ensure that the data are consistent with the procedures and requirements of the project. Information must be recorded in sufficient detail to allow traceability of the data as they flow from one project task to another, and data values must be consistent.

2.3 APPROACH

The Energy Systems Automated Data Processing Systems Development Methodology (SDM), a procedure for the development of scientific and technical information systems, has been used for the design and implementation of the IMS. The SDM reduces the system development process into a series of logical phases. Each successive phase narrows the system development uncertainty. These phases, in order of execution, are project initiation,

feasibility study, requirements definition, data management plan and functional system design (DMP/FSD), computer system design (CSD), programming and implementation, valiuation and acceptance, configuration control, and postimplementation review.

The FSD provides a detailed functional description of the system. The logical system flow, logical data organization, system inputs and outputs, processing rules, and operational characteristics are defined and described from the user's viewpoint. This document is the deliverable from the FSD phase.

An IMS with a single project data repository is being developed to ensure that objectives for data organization, integrity, security, traceability, and consistency are met.

3. REQUIREMENTS DEFINITION

The following system requirements have been identified, at a high level, as critical to the successful implementation of the IMS and the success of the project. The remainder of this document describes the mechanisms for meeting these requirements. Chapter 11 contains a reconciliation of each requirement to the mechanism. Appendix A contains the entity relationship diagram that shows the data categories and the relationships among the data required to support the system. Appendix B contains the entity hierarchy report, an alphabetical list of the entities and their corresponding attributes. Appendix C contains the entity definition report, an alphabetical list of the entities, their definitions, the subject areas to which they belong, their properties, the attributes contained within them, their relationships to other entities, and their identifiers. Appendix D contains the attribute definition report, showing the attribute names, descriptions, properties, lengths, and default values.

The data needed to support the projects were developed through the use of software information engineering techniques. Project members providing input included field crews, project technical leads, data managers (DMs), laboratory coordinators (LCs), data validation managers, and the IMGs. Peer review and input to the data model were solicited from the Environmental Restoration (ER) data management program and the OREIS project. Reviewing projects with similar data needs, including the Energy Systems Laboratory IMS model, the Bechtel data model, Y-12 Groundwater program forms and data structures, and the K-25 Groundwater program, produced additional information.

3.1 SYSTEM OBJECTIVES

- To support the project data lifecycle. This project encompasses all project data management activities, including project planning, field measurement collection, sample tracking, laboratory analyses of environmental samples, data verification and validation, data evaluation and assessment, data consolidation and storage, data analysis, spatial analysis and mapping, summarization and data reduction, and data transfer to OREIS.

- To support simulations and risk assessment calculations, data presentation, data product documentation, and data document archival.

- To support the entire field sample collection process. The system will ensure accountability and traceability by generating and maintaining unique sample identifiers, tracking sample data, incorporating field measurements, and logging sampling team information.

- To support the collection of sample data from various media and data sources, including surface water, biota, groundwater, seeps and springs, sediment, field log books, sampling plans, laboratory measurements, QA sample measurements, and meteorological measurements.

- To support the timely production of status reports to be provided to the project manager on a monthly or other periodic basis as determined in the QAPjP.

- To provide for retrieval of all pertinent information regarding the status of specific monitoring/sampling events and the current status of individual samples.

- To support ad hoc requests for data to meet specific information requirements of project staff.

- To support the coordination and tracking of laboratory analysis results.

- To facilitate the electronic submission of sample results from analytical laboratories.

- To provide support for near field and/or laboratory data, including electronic validation.

- To provide organization, integrity, security, traceability, and consistency for electronic data.

- To provide data structures and written procedures to minimize the introduction of error resulting from unsatisfactory data.

- To facilitate transfer of project data to the ORNL ER site data base.

- To ensure the timely and accurate transfer of validated data to the OREIS data base.

- To implement data change control by identifying access needs to project data through role definitions [e.g., field team leader, data manager, analytical services coordinator (ASC), etc.] and defining access views to data structures based upon the specified user role.

- To model data management rules and data structures for the project using the Texas Instruments, Inc., Information Engineering Facility® (IEF®) tool.

- To ensure that software applications (e.g., SAS® applications, ORACLE® reports) will be under configuration control.

- To facilitate consistent and comprehensive project data/records storage and retrieval and support computerized records management.

3.2 INPUT REQUIREMENTS

Bar coding technology will be used to facilitate the transfer of field and laboratory information into project data bases. The system must be able to read, cross-check, and validate information from a bar code wedge reader and/or keyboard.

- Selected field and laboratory QC data will be maintained in the IMS.

- Information from SAPs will be entered into field collection reference tables. The reference tables will then be used to begin populating the field and laboratory processing task maps (LPTMs).

- Information from chain-of-custody (COC) forms will be stored in the IMS to facilitate the tracking of samples.

- Data files (e.g., bar code files, electronic data packages, etc.) will be uploaded to a temporary area in the IMS and will be transferred from that area to the appropriate data base tables. Any errors in loading will be flagged and corrected by the appropriate project member. Data entered will be verified by review of manual data entry and electronic-to-hard-copy data packages at levels appropriate for the project.

- Data will be entered from external labs as specified in the laboratory statements of work (SOWs). The "interagency format" for the Contract Laboratory Program (CLP) methods will be used. The SOW will specify a consistent electronic data format for non-CLP methods.

- Any changes made to items under configuration control will be logged in an electronic transaction file.

3.3 OUTPUT REQUIREMENTS

The IMS will generate COC forms and labels for sample containers based on the information contained in the field and laboratory processing task maps, which contain the information needed to assemble sample containers for a task, location, and sampling day.

The IMS data base will support the generation of tabular, graphical, and statistical presentations of data collected during monitoring events. The organization of the data will support the ability to retrieve the data by study area, sample type or sample delivery group (SDG), location within study area, and sample depth or sequence number.

All requests for access to project information will require the approval of the project manager.

3.4 PERFORMANCE REQUIREMENTS

The IMS for WAG 6 and CRRI will reside on Sun (SPARCstation 10) workstations. Data will be stored using the ORACLE® Data Base Management System. SAS®, a data analysis (query, statistics, and graphics) software tool, and ARC/INFO® [a geographic information system (GIS)] will also be available. This computer platform and set of software tools are directly compatible with OREIS.

The WAG 6 system will be used as a computer and software backup in the event of a CRRI computer system outage of more than one week. Conversely, the CRRI system will be used as a computer and software backup in the event of a WAG 6 computer system outage of more than one week. The CRRI and WAG 6 systems will have identical physical data base structures, similar hardware configurations, and many of the same information management procedures, which will enhance their backup capabilities. The two systems will be housed in distinctly separate physical locations with separate utility connections.

3.5 COMPUTER SECURITY AND ACCESS CONTROL

- Computer system access will be controlled by the username and password protocols provided by Computing and Telecommunications Services (C&TS).

- Access to project data will be controlled through defined data views based upon user needs and roles.

- Data will be backed up on a daily basis. Weekly backups will be made and stored off-site. At the end of each calendar year, a yearly backup file will be created and saved for historical use.

- The computing platform, data bases, and programs will be protected from unauthorized access, deletion, and modification through the use of locked office space for the workstation, system access control, and software configuration control tools.

- Software application version numbers will be maintained for configuration control.

3.6 GENERAL SYSTEM REQUIREMENTS

- All sample identifiers will be retained in the data base regardless of whether the corresponding sample was collected.

- The majority of the applications supporting the project will be run on the workstation to minimize the number of data transfers and therefore reduce potential errors.

- A project electronic mail (E-mail) account will be established on the workstation to solicit users' input regarding performance, capability needs, etc.

- The field sampling team leader (FSTL), ASC, and LC will be able to query the IMS on demand to generate a list of samples where delivery of the analytical results exceeded the specified time frame.

- Each laboratory data package will be identified with a SDG number, and all samples contained in the package will be tied to this number.

- Field measurements will be collected and the information stored in the IMS as part of the monitoring activities for the various matrices (e.g., surface water and ground water levels, meteorological data, seeps and springs, etc.).

4. PROCESS SUMMARY AND SYSTEM RULES

This section summarizes the major processes involved in managing the information generated and required by the WAG 6 and CRRI programs. Data to be incorporated into the IMS will either be recorded on data forms or obtained in electronic format. Where applicable, system rules and data constraints are also described. If data have only certain values that are acceptable (e.g., monitoring locations, sampling team badge numbers, and equipment identifiers), these values will be stored in the ORACLE® data base tables used for data entry validation.

The CRRI and WAG 6 projects have project-specific information needs that will be noted throughout this document. The tasks within each project are not consistently performed as part of the same role and can even span more than one role. When the same function is performed under the heading of different roles, the CRRI role will be listed first, followed by a slash and the WAG 6 role. For example, "FSTL/DM" indicates that the CRRI FSTL and the WAG 6 DM will perform a particular function for their respective projects. This same CRRI role/WAG 6 role denotation will be used when different terminology is significant within each project (e.g., performance exception report/nonconformance report (NCR). Chapter 7 contains descriptions of all the roles for the projects.

For the purposes of this document, the Clinch River preparation laboratory is equivalent to the WAG 6 staging area, and the Clinch River Task Leader is equivalent to the WAG 6 Field Task Manager (FTM).

After a section on general information, the remaining sections follow, as much as possible, the order in which the processes normally occur. Responsibility matrix and process flow diagrams are included to summarize information flows and responsibilities. Shaded boxes in these diagrams indicate information input to the project data base. Any process not explicitly described in this section will not be automated. For example, the tracking of samples that fulfill specific monitoring requirements will be performed manually.

4.1 GENERAL

Monitoring includes one-time sample collection and repeated sample collection over time. Throughout this document, the terms *monitoring* and *sampling* are synonymous.

Each preparation laboratory/staging area is assigned a set of preprinted adhesive-backed labels to use as sample identifiers. The preparation laboratory/staging area personnel are responsible for documenting the use of all labels. All unique sample identifiers are retained in the data base and never reused, even if the sample is lost or not collected. To prevent the reuse of preassigned sample identifiers, the sample status attribute will be used to flag unused sample identifiers as "retired."

The system must permit bar code label information to be read and validated from a bar code wedge reader and/or keyboard.

The IMS will track all forms associated with samples, equipment, and monitoring events. This allows the IMS to document all forms on which a particular sample appears and, conversely, all samples that appear on a particular form. It also documents the forms associated with field measurements and equipment events (e.g., inspection, calibration, and repair).

When an item is placed under configuration control, a transaction record will be created for any changes made to that item. Examples of configuration-controlled items include the COC and the sample collection forms.

4.2 IDENTIFICATION AND SELECTION OF ANALYTICAL SERVICES

The Analytical Project Office (APO) reviews subcontracts for direct analytical support for the CRRI and WAG 6 programs. For CRRI, the APO is also responsible for the procurement. The APO must approve nondirect analytical subcontracts and associated task orders and requests for analytical services from Energy Systems laboratories. APO approval covers analytical methods, QA and QC requirements, deliverables, appropriateness of the laboratories to provide the requested services, and any other requirements specified in the analytical plan.

An analytical service packet is prepared for CRRI by the project analytical services group (ASG) based on ER Program requirements. For WAG 6, the subcontractor develops an SOW for laboratory procurement. The SOW and laboratory procurement are reviewed and approved by the APO to ensure compliance with internal technical requirements and procedures before contracting. The information packet/SOW specifies methods, quantitation limits, sample preservation, holding times, containers, QC requirements, required deliverables, reporting forms, and electronic data specifications. The analytical service packet is distributed to the appropriate task leaders, data base manager, program manager, QA/QC coordinator, ER Division QA specialist (QAS), the APO, and other appropriate technical reviewers.

When all questions have been addressed, the CRRI analytical service packet is transferred to the APO for procurement of analytical services. The analytical SOWs may be sole-sourced, placed with an internal laboratory, or placed out for bid under the Energy Systems Pricing Agreement. If the laboratory is not part of the Energy Systems Pricing Agreement, a specific procedure detailing the procurement steps will be followed. The laboratory is selected based on the low bid and any exceptions that are placed on the work by the laboratory. Approval of all procurement contracts is the ultimate responsibility of the program or project manager.

After the laboratory is selected, the ASC/LC or a designee appointed by the ASC/LC will review the laboratory QA plan (LQAP) and standard operating procedures, APO audit reports, the laboratory's performance evaluation package, and the cost estimate (with assistance from financial personnel). If needed, the ASC/LC may schedule or request other audits or conduct a readiness review with the laboratory. Any corrective actions resulting from these reviews or audits will be documented and resolved before work begins. The SOW is revised, if necessary, and signed. One copy is retained in the project files and another is forwarded to the APO.

4.3 CATALOG MONITORING LOCATIONS

A monitoring location is a uniquely-identified physical location where monitoring may be performed. The valid monitoring locations for WAG 6 will be maintained in a table in the IMS, and CRRI personnel will enter the monitoring location at the beginning of the monitoring event. [The CRRI locations are not based on static sites (e.g., wells and meteorological stations).] The IMS will maintain alias names for monitoring locations in order to accommodate historical data. A monitoring location may be taken out of service during the project.

To facilitate the grouping of different monitoring locations for data analysis and reporting, monitoring locations may be grouped into different area groups. IMS users will be able to group monitoring locations by defining and naming area groups.

The Global Positioning System (GPS) and/or survey information will be used to record each monitoring location. GPS data includes the latitude, longitude, ellipsoid height, and the standard errors for these measurements. Each set of GPS data will have a unique identifier. For CRRI, GPS data will be generated for each monitoring event. CRRI monitoring locations are defined as variable. By definition, a variable location is one that is not specifically defined by a set of latitude and longitude or easting and northing coordinates—for example, a location on a river indicated by mile marker 3. A monitoring location is fixed if it has a defined set of coordinates that do not change with each sample collection event—for example, the location of a well. For WAG 6, all monitoring locations are fixed, and GPS data will be collected only once for each newly defined collection point. Coordinates will be derived from other data sources for previously defined monitoring locations. The IMS denotes a location as fixed or variable by means of the GPS variation code.

The matching of GPS data to the monitoring event for varying locations or monitoring locations for fixed locations will be accomplished by means of the GPS identifier (consisting of GPS instrument identifier, date, and instrument generated GPS identifier) stored in the appropriate tables during the loading of sample or measurement data. Since the latitude and longitude or easting and northing coordinates are required before data are loaded to the OREIS, no collection data may be sent to the OREIS without the GPS data. If, for some reason, the GPS data for a varying location collection or measurement event are not usable, the latitude and longitude for the event will be determined from field maps used in conjunction with the GIS and identified appropriately.

The original GPS data files will be maintained as historical data.

4.4 EQUIPMENT RECORDS

The IMS will maintain a list of field equipment and its status. Data relevant to equipment initialization events, inspection events, calibration events, and repair/maintenance events will also be tracked. The responsibilities and flow for equipment operations are shown in Fig. 4.1.

4.4.1 Maintain Equipment Inventory

A list of field equipment and status (e.g., "available for use", "in use", "temporarily out of service", and "retired") will be maintained. Each piece of field equipment will be uniquely

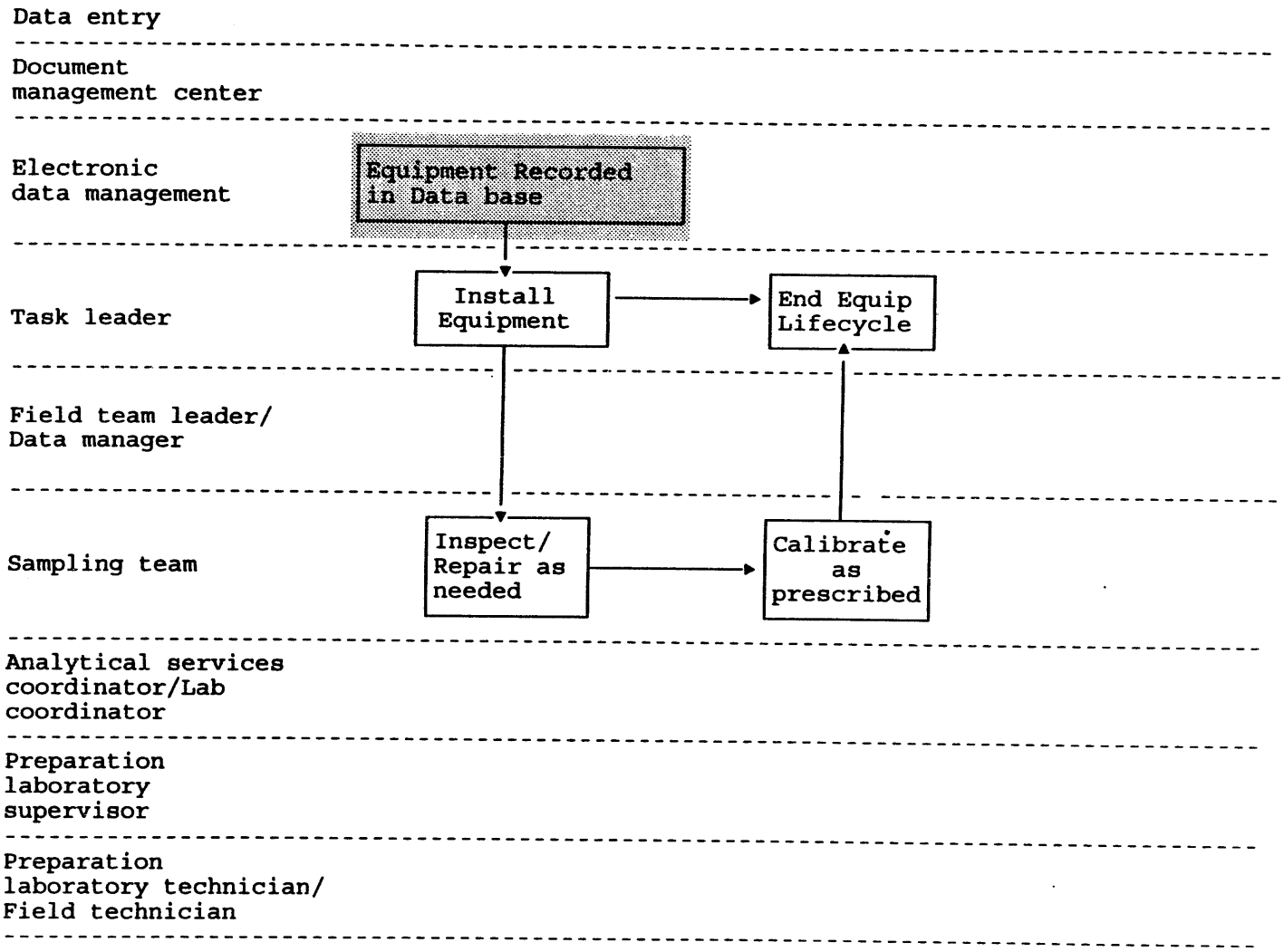


Fig. 4.1. WAG 6 Responsibility Matrix and Process Flow of Equipment Records.

identified with a bar code identifier, but it will not have an Energy Systems number. Other equipment data to be maintained by the system include the equipment type, the equipment model number, the manufacturer's serial number, the manufacturer, the date the equipment was entered into the system and the badge number of the person performing the inventory, the date the equipment was retired from use, the last date that a particular piece of equipment was calibrated, and any associated comments/remarks.

When a piece of equipment is to be entered into the IMS, two bar code labels with the same number will be generated. One will be laminated and attached to the equipment, and the other will be affixed to the record-of-inventory worksheet to be scanned into the bar code reader for input into the data base. Additionally, the badge number of the person performing the inventory will be scanned. The date and time the equipment was entered into the inventory will be recorded in the bar code reader using its internal date and time. An application will be created to allow the user to input additional information from the record-of-inventory worksheet into the data base.

4.4.2 Perform Field Equipment Initialization

Field equipment may be placed at a monitoring location for an extended period of time. The system will track the date and time that a piece of field equipment is initialized at a given location, the badge number of the person who initialized the equipment, the date the equipment is taken out of service at a location, and any associated comments. In addition, the system will track the form numbers—including the logbook number—associated with the initialization event. The following data will be scanned into the bar code reader and/or entered on the relevant inspection form during equipment initialization: the monitoring location identifier, the equipment identifier, the field logbook number used during the event, the badge number of the person initializing the equipment, and the form number associated with the event. The date and time of the event will be recorded in the bar code reader using its internal date and time. When an initialization event is performed, the equipment status code will be set to "in use."

If the equipment is defective when it is initialized in the field, a repair event will be initiated manually.

4.4.3 Perform Field Equipment Inspection

Field equipment will be inspected periodically. The system will track the date of inspection and the badge number of the person who inspected the equipment. In addition, the system will track the form numbers—including the logbook number—associated with the inspection event. The following data will be scanned into the bar code reader and/or entered on the forms during equipment inspection: the monitoring location identifier, the field logbook number used during the event, the badge number of the person inspecting the equipment, and the form number associated with the event. The date and time of the event will be recorded in the bar code reader using its internal date and time. An inspection event will initiate a field equipment repair event if the equipment fails the inspection. (This will be a manual trigger. The system will not trigger events from other events.)

4.4.4 Perform Field Equipment Calibration

Field equipment may have one or more equipment calibration events. The system will track the type of calibration event being recorded (e.g., initial or check), the date and time of calibration, the badge number of the person who performed the calibration, and any form numbers—including the logbook number—associated with the calibration event. The system will track when the equipment is actually calibrated. The planned calibration dates will be manually tracked. Equipment calibration frequency depends upon the type of measurement equipment used for sampling (e.g., daily calibration, calibration between samples). The following data will be scanned into the bar code reader and/or entered on the relevant calibration form during equipment calibration: the equipment identifier, the monitoring location identifier, the field logbook number used during the event, the badge number of the person calibrating the equipment, and the form number associated with the event. The date and time of the event will be recorded in the bar code reader using its internal date and time.

Each equipment calibration event may culminate in one or more results. Information to be stored in the equipment calibration event result includes the temperature at the time of calibration, the resultant calibration value, the calibration unit of measure, a text comment field, and a calibration flag. Calibration results will be manually entered into the bar code reader and/or recorded on the appropriate calibration form.

4.4.5 Perform Field Equipment Repair

When field equipment is repaired, the system will track the date the repair event was initiated, the badge number of the person initiating the repair, the date the equipment was sent off for repair, the date the equipment was returned after being repaired, and any associated comments. If the equipment cannot be repaired at the location, the equipment status will be changed to "out of service." The form number associated with the repair event will also be tracked by the system. The following data will be scanned into the bar code reader and/or entered on the form when a repair event is initiated: the equipment identifier, the badge number of the person initiating the equipment repair, and the form number associated with the event. The date and time of the event will be recorded in the bar code reader using its internal date and time.

If the equipment can be repaired in place, it will be noted in the comments field for the repair event. The status will not be changed. On the equipment initialization forms, there will be a field for an equipment removal flag. If the flag is "Y," and the status is already set to either "in use" or "available," the equipment status will be defaulted to "available." If the status on the equipment is already set to "temporarily out of service" or "retired," then it will not be changed regardless of the value of the equipment removal flag on the initialization form.

4.5 DEFINE PROJECT TASKS

A field collection reference table is populated, using the SAPs as a guide, for each task by medium and activities within each medium. The reference table, a planning tool, specifies by task, medium, and optionally by site, the procedures, preservation requirements, size and type of containers, processing type, collection devices, sample types, analysis category, outfall, organization performing the sampling, analytical lab, and any special instructions required to

perform a specific task. Not all of these data will be specified for each task and medium. All fields in the reference table are validated except processing type, outfall, organization, and special instructions. Task leaders use the reference table as a template for generating field collection task maps (FCTMs) and LPTMs as discussed in Sects. 4.6.1 and 4.10.1. Initially, the LPTM will not be used by WAG 6. The FCTM for CRRI is shown in Fig. 4.2 and for WAG 6 in Fig. 4.3. Figure 4.4 contains a copy of the LPTM.

The fields entered for the FCTM will include the collection procedures, collection devices, sample container size and type, processing, preservatives, field matrix, and analysis needed for each task. The analysis field will contain either the parameter analysis category (e.g., inorganic) for field samples undergoing further preparation laboratory processing (e.g., compositing, filtering, and sample splits) or parameter analysis group (e.g., pesticides/polychlorinated biphenyls) for field samples that are submitted directly to the analytical laboratory with no preparation laboratory processing. The fields entered on the LPTM will include the processing procedure, laboratory sample container size and type, processing, preservatives, laboratory matrix, analysis laboratory, and analysis needed.

To support the creation of the FCTM and the LPTM, the data base will provide a relationship based on an artificial key to link the planned field samples to their subsequent processing laboratory samples.

4.6 PREPARATION FOR FIELD SAMPLING

Sampling preparation includes generating the FCTM and preparing the necessary sampling kits. A sampling kit is used to assemble the containers and paperwork necessary to perform monitoring events on a planned sampling schedule. The responsibilities and flow for these processes are shown in Fig. 4.5 and summarized in Sects. 4.6.1 and 4.6.2.

4.6.1 Prepare FCTM

A sampling/activity schedule (Figs. 4.6 and 4.7) is manually prepared each week by the task leaders. This schedule identifies the task, sampling location and date, and the number and type of samples to be collected. For each task and site, the types of samples to be collected are identified. The field collection reference table is then used to populate the FCTMs based on the sample types requested in the sampling/activity schedule. The schedule is sent to the sampling team leader (STL) at least 2 d before sampling begins, and a copy is also sent to the ASC/LC.

The FSTL/DM uses the schedule to initiate an FCTM, which describes the type of samples to be collected at each location. The FCTM is generated by a data base application program and includes the task, sampling date, kit identifier and preparation date, field COC (FCOC)/field activity sheet (FAS) number (generated sequentially by the computer for WAG 6), and field logbook number. The FSTL/DM enters pairs of site and sample type until all sites comprising the monitoring event have been specified. The FSTL may elect to include some spare containers as backup in case of breakage. The location and sample type of the spares are not specified. These spares have a status of "surplus." Surplus containers may be relabeled and reused at the discretion of the FSTL, but the sample identifiers will not be reused.

Field Collection Task Map
Clinch River ER Project - Phase 2

Field Matrix: _____ **Kit Identifier:** _____

Task: _____ **Kit Preparation Date:** _____

Sampling Date: _____ **Field COC Number:** _____

Field Log Book Number: _____

Site	Field ID	Collection Device	Collection SOP	Sample Container			Process	Preserv	Analysis Group	Sample Type
				Size	Type	Lot				

Completed by: _____ **Document ID:**

Date: _____ FCTM-1 08/11/93

Fig. 4.2. CRRI Field Collection Task Map.

Field Collection Task Map
Waste Area Grouping 6

Field Matrix: _____ **Kit Identifier:** _____

Task: _____ **Kit Preparation Date:** _____

Sampling Date: _____ **Field Activity Sheet Number:** _____

Field Log Book Number: _____

Monitoring Location	Sample ID	Collection Device	Collection FOP	Sample Container			Process	Preserv	Analysis Group	Sample Type
				Size	Type	Clean Lot				

Completed by: _____ **Document ID:**

Date: _____ **FCTM-1 08/19/93**

Fig. 4.3. WAG 6 Field Collection Task Map.

Laboratory Processing Task Map
Clinch River ER Project - Phase 2

Field Matrix: _____

Task: _____

Field ID	Process	Process Date	Preserv.	Lab Container			Lab ID	Sample Type	Lab Matrix	Analysis Group
				Size	Type	Lot				

Completed by: _____ **Document ID:**

Date: _____ LPTM-1 08/16/93

Fig. 4.4. Laboratory Processing Task Map.

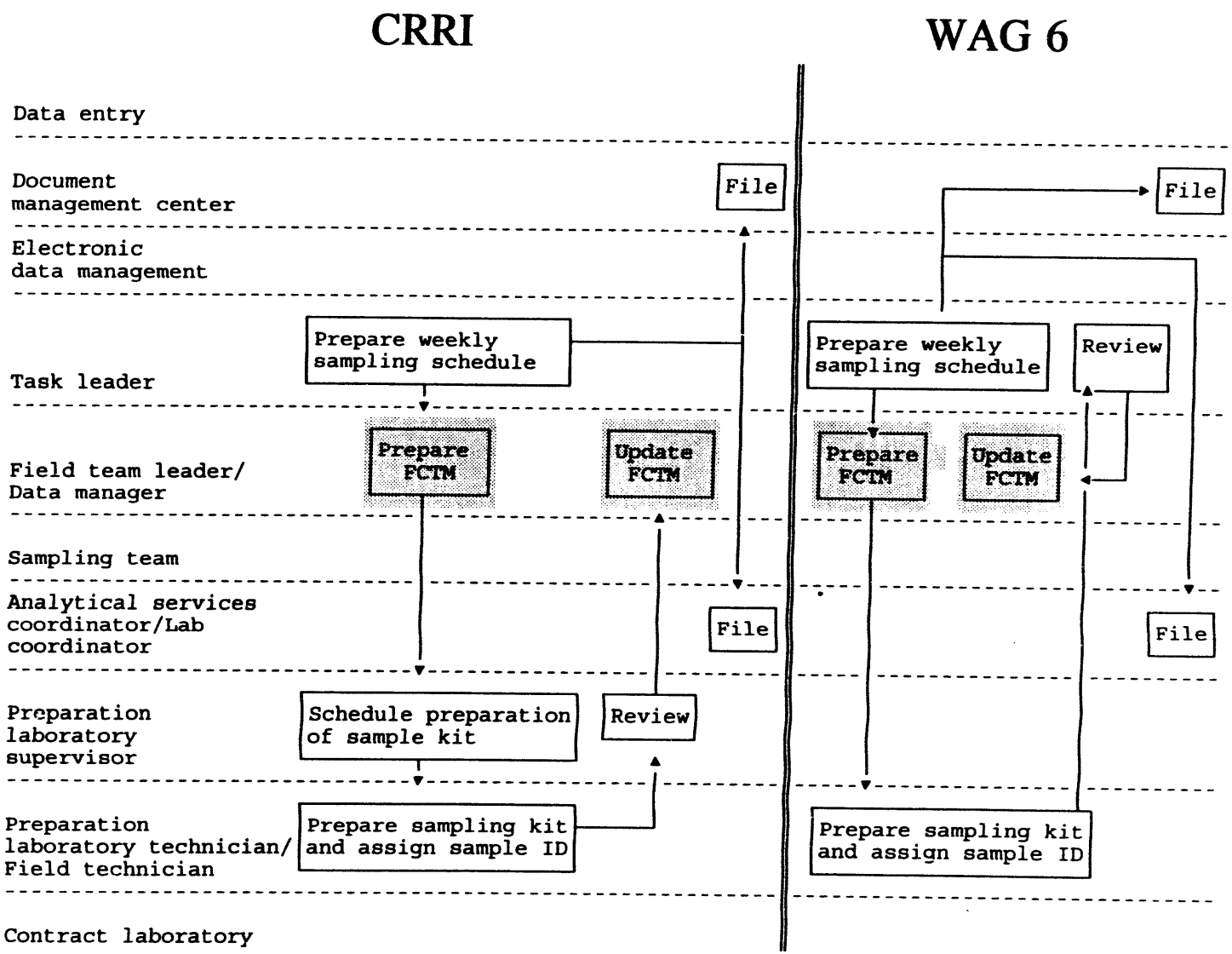


Fig. 4.5. Responsibility Matrix and Process Flow of Preparation for Field Sampling.

WEEKLY SAMPLING SCHEDULE

CLINCH RIVER ER PROJECT PHASE II

Date:

Task	Site	Sample Type					Special Instructions
		FLD	FD	FB	RB	TB	

FB = Field Blank; FD = Field Duplicate; FLD = Field Sample; RB = Rinse Blank; TB = Trip Blank;

Completed by: _____

Date: _____

Fig. 4.6. CRRI Weekly Sampling Schedule.

WAG 6 - WEEKLY ACTIVITY SCHEDULE WORKSHEET

FTM Badge #: _____ Date: (mm/dd/yy): __/__/__

Groundwater Quality				
Activity Period:				
Site ID's		Surplus Bottles		
		Number	Type	Volume

Surface Water				
Activity Period:				
Site ID	Type of Sampling	Surplus Bottles		
		Number	Type	Volume

Seeps and Springs				
Activity Period:				
Site IDS		Surplus Bottles		
		Quantity	Type	Volume

FTM: Signature/Date: _____

Data Entry Signature/Date: _____

Data Verification Signature/Date: _____

WAS-01 10/04/93 WAS-01

Fig. 4.7 WAG 6 Weekly Activity Schedule.

Based on the task and sample type specified by the FSTL, the application identifies the procedure, sampling device and container, processing equipment, and preservative needed for each sample that will be collected. The field sample identifiers are not specified at this point. The FSTL reviews the FCTM for accuracy and completeness. If mistakes are found, the FSTL/DM makes the necessary corrections to the FCTM record. The corrected FCTM is generated and forwarded to the preparation laboratory supervisor/task leader and a copy is sent to the WAG 6 LC. The LC will FAX the FCTM to the analytical laboratory and confirm its receipt by telephone.

4.6.2 Prepare Sampling Kit

The preparation laboratory supervisor/task leader receives the FCTM and assigns a technician to prepare a sampling kit. The technician uses the FCTM as a guide to determine the preservative and size and type of container needed for each sample. Once a container is prepared, the technician attaches the next available preprinted bar code label to the container and notes the sample identifier and container cleaning certificate lot number on the FCTM report. The labelled containers are grouped with the appropriate forms, usually in a cooler, and assigned a unique kit identifier. The technician enters the kit identifier and kit preparation date on the FCTM.

In a future release of the IMS, computer generated sample labels with the requested analysis, sample lab, and sample collector company name and address will be provided.

When all the sample containers are prepared, the technician returns the FCTM to the laboratory supervisor/task leader who reviews and sends it to the field sampling FSTL/DM. The FSTL/DM updates the FCTM record in the data base with the handwritten information from the FCTM form. When the FCTM is complete, a copy is printed and a document control identifier is attached by the technician/DM and entered into the data base.

Once the FCTM is complete and stable, the user will commit the data in the FCTM to the data base. The FCTM must be committed to the data base before generation of the FCOC and FAS is generated.

4.7 FIELD SAMPLING

A monitoring event is defined as a set of samples and/or field measurements collected at one monitoring location on a given date. Field samples and measurements are collected by a team. The CRRI team consists of a leader, sample custodian, and sampling technicians. The WAG 6 team consists of a FSTL and field technicians (FTs). A field team may perform several monitoring events during a day. For WAG 6, a monitoring event can span multiple days. CRRI may have a different monitoring event for each day.

The FSTL is ultimately responsible for everything pertaining to a monitoring event. The sample custodian/FT is responsible for all field samples collected during the sampling day. Sampling team members and roles are tracked in the data base by the FCOC/FAS. If the person performing the task changes during the day, the change is recorded in the field logbook, but not recorded in the data base. Visitors accompanying the team are noted in the logbook but are not recorded in the data base.

The major processes of field sampling from an IMG perspective are the generation of the FCOC/FAS form and the recording of field data. Figure 4.8 summarizes the process flow and responsibilities.

4.8 GENERATE FIELD CHAIN-OF-CUSTODY/FIELD ACTIVITY SHEET

The FCOC/FAS form is used to document the samples collected by a sampling team for laboratory analysis. Figures 4.9 and 4.10 show the FCOC/FAS forms. All samples listed on the FCOC/FAS must be placed into a container (i.e., bottle) and returned from the field. An FCOC/FAS can cover multiple monitoring locations and events. The FCOC accompanies the sampling team to the field and remains with the samples until a sample is transferred to another COC form. Occasionally, for CRRI, cosampling with non Energy Systems crews may occur for certain tasks. This situation is documented in the field logbook and defined in the FCTM. Preprinted sample labels and FCOC forms will be provided for the cosampling crew.

On the day of sampling, the FCOC/FAS is generated using the FCTM information stored in the data base. For WAG 6, the field technician (FT) will call the DM with the badge numbers of the sampling team, give the corresponding FAS number to which the DM should apply the badge numbers, and will request that the FAS be printed for sample collection by the STL. The FSTL/DM enters the names and roles of the team members for the FCOC/FAS. The sampling date may also be corrected at this time if needed. The application accesses the data base to obtain the information from the FCTM referenced by the FCOC/FAS identifier. For CRRI, the FSTL obtains the next preprinted document identification label, enters this identifier into the data base, prints the FCOC, and attaches the label to the first page of the report. All data base fields represented on the FCOC are under change control. For WAG 6, the DM will deliver the printed FAS to the FTM for review. When the FAS is correct, the FTM will attach the next sequential FAS series bar code identifier to the form and give it to the STL for sample collection.

4.9 COLLECT FIELD MEASUREMENTS AND SAMPLES

Before a team goes into the field, they check their field notebooks to make sure they have enough pages to record all of the information while they are out. This ensures that each field form will have only field notebook associated with it.

4.9.1 CRRI Collect Field Measurements and Samples

When the CRRI team arrives at a monitoring location, the GPS is activated to establish the site coordinates. The FSTL assigns tasks, such as data recording and sampling, to the team members. Site field measurements (e.g., current and water column temperature) are made and recorded on the appropriate forms or entered into a hand-held bar code reader, if available.

When a field sample is collected, the data recorder notes the sample identifier, site, time, sediment type, water depth, collection depth, map station, location type, bank, and field notebook pages on the sample collection form. The sample is transferred from the collection device to the appropriate sample container as directed by the FCOC. If any information on the FCOC form is incorrect (e.g., the sample collection location differs from than that listed on COC), the field custodian strikes through the incorrect field with one line, makes the

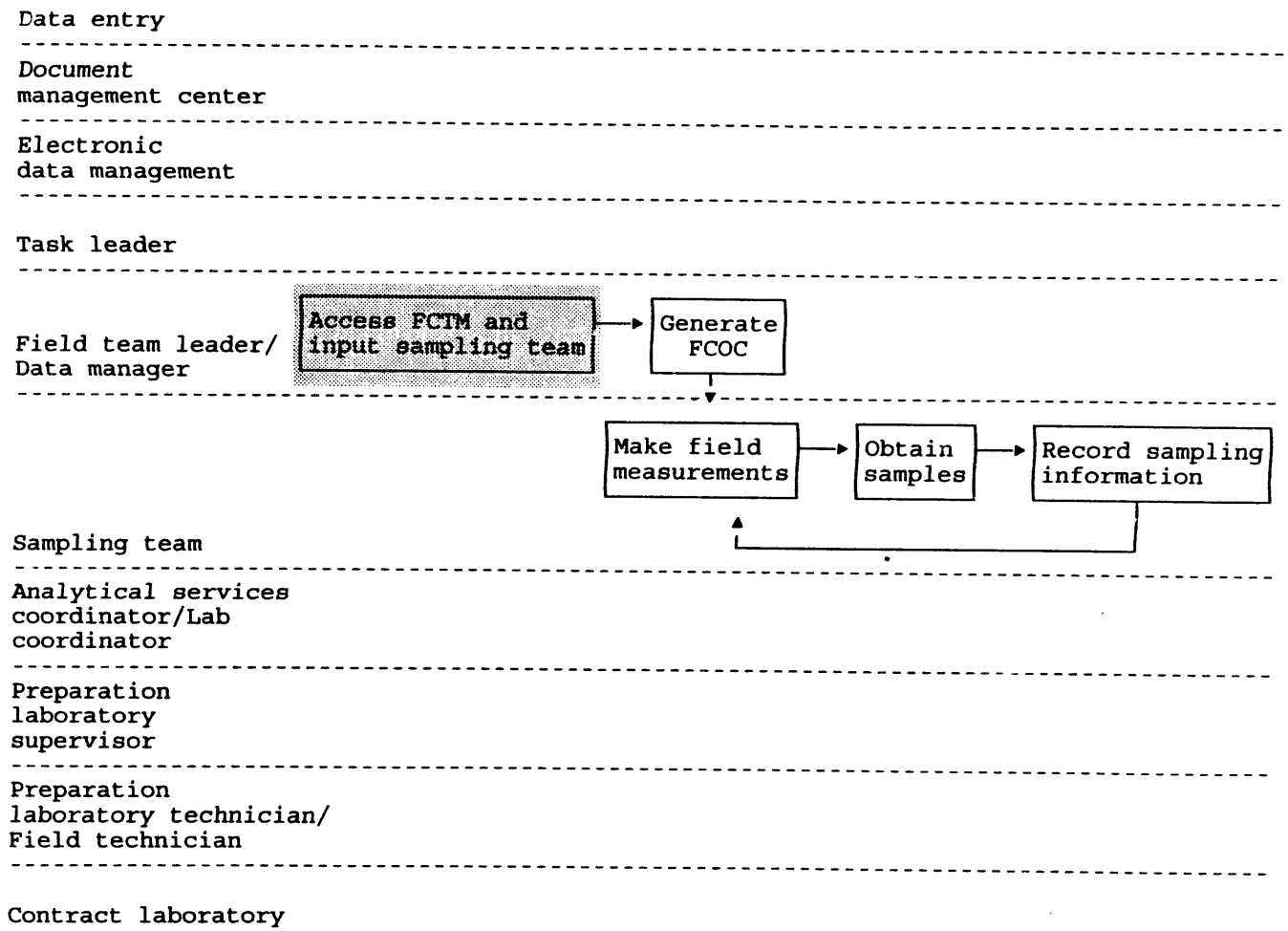


Fig. 4.8. Responsibility Matrix and Process Flow of Field Sampling.

FIELD CHAIN OF CUSTODY

CLINCH RIVER ER PROJECT	SAMPLING DATE:	FIELD COC ID:	PAGE OF
TASK:	MATRIX:		KIT CONTAINER ID:
TEAM LEADER:	SAMPLING TEAM:		
FIELD CUSTODIAN:			

SAMPLE ID	SAMPLING SITE	SAMPLE TYPE	CONTAINER		ANALYSIS	SAMPLING DEVICE	COLLECTION SOP	REMARKS
			TYPE	VOLUME				

CONTAINER TYPES:

SAMPLE TYPES: RB = Rinse Blank, FB = Field Blank; SPK = Spike; TB = Trip Blank; FLD = Field Sample; FD = Field Duplicate:

ANALYSIS TYPES: RAD = Rads; MET - Metals, ORG = Organics; INO = Inorganic; PHY = Physical ; PW = Pore Water

RELINQUISHED BY:	DATE:	TIME:	RELINQUISHED BY:	DATE:	TIME:
RECEIVED BY:	DATE:	TIME:	RECEIVED BY:	DATE:	TIME:

FCOC REV. 1 16AUG93 DOCUMENT ID:

Fig. 4.9. Field Chain-of-Custody Form.

WAG 6 FIELD ACTIVITY SHEET

WAG 6 PROJECT	SAMPLING DATE:	FIELD COC ID:	PAGE OF
TASK:	MATRIX:		KIT CONTAINER ID:
TEAM LEADER:	SAMPLING TEAM:		
FIELD CUSTODIAN:			

SAMPLE ID	MONITORING LOCATION	SAMPLE TYPE	CONTAINER		ANALYSIS GROUP	SAMPLING DEVICE	COLLECTION FOP	REMARKS	PRESERVATION	SHIPPING CONTAINER
			TYPE	VOLUME						

CONTAINER TYPES: P = High Density Polyethylene, G = Glass, T = Teflon

SAMPLE TYPES: RB = Rinse Blank, FB = Field Blank; TB = Trip Blank; FLD = Field Sample; , MS/MSD

ANALYSIS TYPES: RAD = Rads; MET - Metals, ORG = Organics; INO = Inorganic; PHY = Physical ; PW = Pore Water

RELINQUISHED BY:	DATE:	TIME:	RELINQUISHED BY:	DATE:	TIME:
RECEIVED BY:	DATE:	TIME:	RECEIVED BY:	DATE:	TIME:

FCOC REV. 1 16AUG93 DOCUMENT ID:

Fig. 4.10. Field Activity Sheet.

correction, and initials the change. If a sample listed on the FCOC is not collected, the field custodian strikes through the appropriate line on the COC and specifies in the remarks section the reason for not collecting the sample.

4.9.2 WAG 6 Collect Field Measurements and Samples

For the WAG 6 sampling effort, when a field sample is collected, the FT notes the sample identifier, monitoring location, time, field logbook number and the badge numbers of the sampling team on the FAS. If field measurements are taken, the appropriate entries are made on the form and scanned into the bar code reader, if available. The sample is transferred from the collection device to the appropriate sample container as directed by the FAS.

During sample collection, if any information on the FAS is incorrect or a surplus bottle is used, the STL will cross through the incorrect information with one line and will write in the correct information and initial and date the line. The STL will note the time of collection and any other missing information on the form. Once the form and sample collection are complete, the STL will return the FAS to the FTM for review.

Samples are transferred to the staging area (trailers located at WAG 6) for processing before shipment to the analytical laboratories.

4.9.2.1 Process WAG 6 electronic water level data

Surface water and groundwater level monitoring data will be collected at the end of every month (inspections are to occur on a semiweekly basis). Data collection will result in the creation of separate monitoring data files.

Semiweekly equipment checks will be performed in order to determine, at the earliest possible time, if the electronic data are being collected and if the collected values are valid. The STL is responsible for determining at collection time whether all instruments are functioning properly. The STL will perform data verification to aid in problem determination so that corrective measures can be implemented as soon as possible.

The automatic water-level data will be downloaded every month into a personal computer located in the WAG 6 field office. The files will be loaded into SAS® for verification, correction, and compression; and original data files will be archived. Guidelines detailing the procedures to be followed for the identification of bad or missing data will be supplied by the Energy Systems technical lead (ESTL). Automated data verification functions are being evaluated for the annual monitoring program.

Within 5 d of data verification, the STL will provide the ESTL with tabular and graphical reports reflecting the before and after correction views of the data. These reports will be accompanied by a transmittal form that indicates the ranges where values were missing from the original data and explains why the values are missing.

The ESTL will review the reports within five working days, and, will inform the STL if further corrections are in order. When all corrections have been performed, and the ESTL is satisfied with the quality of the data, the ESTL will sign the transmittal form and return it to the STL, who will give the signed form to the DM. When the DM is satisfied that all

information delivered is correct, the DM will load the verified data into the WAG 6 data base and sign and file the form in accordance with records management requirements. All data measurements will be stored at the recorded time interval.

Water level data verification. For the data collected to be useful in modeling water levels at WAG 6, there can be no missing data. Because the raw data will routinely contain gaps resulting from the collection functions themselves, and because the potential exists for gaps in the data resulting from equipment malfunctions, the STL and Environmental Sciences Division (ESD) will attempt to supply missing values in the data in accordance with procedures to be established by ESD. Estimated data in the data base will be noted with the appropriate validation flags.

Water level reporting capabilities. In addition to the tabular files of the data and the before and after correction graphs supplied as part of the data validation procedures, the following reporting capabilities will be developed:

- the ability to extract from the data base selected ranges of data and place them into SAS® data sets, thereby providing the ability to produce predefined as well as ad hoc reports, and

- monthly summaries of daily values with totals.

4.9.2.2 WAG 6 groundwater level measurements

Any calculations using water-level data that must be expressed in terms of elevation will require that the data be adjusted by subtracting the depth to water from the amount of the appropriate reference point. The appropriate reference point is the reference point contained in either the well construction record or the well modification record (if one exists) for the point in time for the depth-to-water measurement value. For example, if a water-level measurement occurred after a well modification event, the depth-to-water reference point will be taken from the appropriate modification record that spans the time and date of the water measurement being examined; otherwise, the well construction record will be used.

The two types of equipment used during the groundwater level monitoring event will be the Telog Level Tracker and HERMIT Data Logger. Automatic water-level measurements will be measured in each of the selected monitoring locations equipped with the Telog Level Tracker. Temperature and conductivity, as well as water levels, will be measured in wells equipped with HERMIT Data Loggers.

Water level measurements obtained with the HERMIT Data Logger will be expressed as depth to water measured from a point-of-reference. No collection device point of reference information will be collected. The point of reference will be generated by survey or by the GPS, as appropriate. The depth-to-water units of measurement are in feet. The point of reference units are in feet and expressed as elevation (vertical displacement from mean sea level). The point of reference for groundwater measurements normally is the top of the well casing.

Water level measurements obtained with the Telog Level Tracker will be expressed as depth to water measured from the top of the well casing. The collection device will store two points of reference in terms of pounds per square inch (psi). This will be based on manual

water level measurements and the manufacturer's specifications, which will indicate the scale the device will use in converting the number of feet associated with psi to depth to water (e.g., for a 10 psi device 0% of maximum will equal -27.68 ft and 100% of maximum will equal 0 ft).

The WAG 6 data base will contain a well construction record that will have the originally determined point of reference. Modifications to a well through time will be captured in a well modification record.

OREIS derives the depth to water from the point of reference in the same monitoring well survey. The definition for point of reference for OREIS and WAG 6 manual water level measurements are the same.

Manual water level. No electronic devices will be used in the manual water-level event. Therefore, there will be no equipment calibration or initialization events. The measurements will be obtained on a semiannual basis with a manual water level probe. The information collected from this measurement will be expressed as depth to water measured from a point of reference. A tape used to obtain manual water levels must be calibrated to .01 according to the Energy Systems procedure. This calibration will be recorded in the field logbook, but will not be recorded in the IMS.

Automatic water level. All measurements will be obtained continuously at 15-min intervals. The calibration of equipment used for downloading the measurements will be checked, and data will be downloaded on a varying basis. The schedule will begin with these events occurring on a daily basis, proceeding to a semiweekly basis, a weekly basis, and finally to a monthly basis for the remainder of the project as specified by the SAP.

4.9.2.3 WAG 6 surface water sampling

Water levels will be determined at most WAG 6 hydrologic structures by electronic level sensors. These water levels will then be translated into a discharge value through the use of preprogrammed structure-specific discharge equation. The water-level data collected will be recorded by the equipment on-site and downloaded by field personnel weekly. At sites where monitoring is to be performed during sampling activities only, water levels will be collected manually with conventional measuring rulers or staff gages.

Flow-paced sampling will be performed by automatic samplers programmed to collect an aliquot of water every time an incremental volume of water passes the monitoring site. The flow meter will tabulate the water volume, activate the sampler, and record the aliquot collection time. The flow-paced sampling data collected will be recorded by the equipment on-site and downloaded by field personnel weekly. At this time, the field personnel must retrieve the composite sample and replace it with a clean sample container.

Storm event sampling will be performed by automatic samplers. The flow-meter located at each site will activate the sampler when the flow passing through the hydraulic structure reaches a predetermined water level. The sampler will continue to collect samples until all bottles are filled or the water level drops below the predetermined level. Personnel will then collect the samples and choose the ones to be analyzed based upon the SAPs.

4.9.2.4 WAG 6 meteorological monitoring data

Meteorological data will be collected every two weeks (inspections are to occur at the meteorological station on a semiweekly basis). Data collection will result in the creation of a minimum of two file types—one containing rain gage data and the another containing temperature, relative humidity, solar radiation, windspeed, wind direction and wind vectors (X and Y coordinates of wind direction and magnitude used to generate a wind rose graph). Data output from the rainfall gage will be on 5-min intervals. All other data gage output will be on a hourly interval.

Semiweekly equipment checks will be performed to determine, at the earliest possible time, if the electronic data are being collected and if the collected values are valid. It will be the responsibility of the STL to determine at collection time if all instruments are functioning properly. Data verification will be performed by the STL to aid in problem determination so that corrective measures can be implemented as soon as possible.

The data storage packs will be swapped out and downloaded every 2 weeks into a personal computer located in the WAG 6 field trailer. The raw data files will then be archived. Figure 4.11 depicts the process flows for meteorological data.

The rain gage data file(s) will be compressed, and missing data values will be identified. The uncompressed files will be loaded into SAS® for validation and correction. Guidelines detailing the procedures to be followed for the correction of bad or missing data will be supplied by the ESTL. Automated data validation functions are being evaluated for the annual monitoring program.

Within 5 d of data validation, the STL will provide the ESTL with tabular and graphical reports reflecting the before and after correction views of the data. These reports will be accompanied by a transmittal form that indicates the ranges where the original data contained missing values; an explanation of why the values are missing; and, if required, the corrective actions taken. (Missing values will be expected when swapping the data storage packs.)

The ESTL will review the reports within five working days and, if further corrections are in order, will inform the STL. When all corrections have been performed and the ESTL is satisfied with the quality of the data, the ESTL will sign the transmittal form and return it to the STL. The STL will give the signed form to the DM. When the DM is satisfied that all information delivered is correct, the DM will load the validated data into the WAG 6 data base and sign and file the form in accordance with records management. All data measurements will be stored at the recorded interval with the exception of the rainfall data. Cumulative rainfall data will be stored. Wind vector data will not be stored in the WAG 6 IMS but will be calculated from the windspeed and wind direction data, as required.

Meteorological data validation. The data collected must be complete to be useful in modeling rainfall and the runoff process at WAG 6. Because the raw data will routinely contain gaps as a result of the collection functions themselves and the potential exists for gaps in the data as a result of equipment malfunctions, the STL and ESD will attempt to supply missing values in the data in accordance with procedures to be established by ESD. Estimated data in the data base will be noted with the appropriate validation flags.

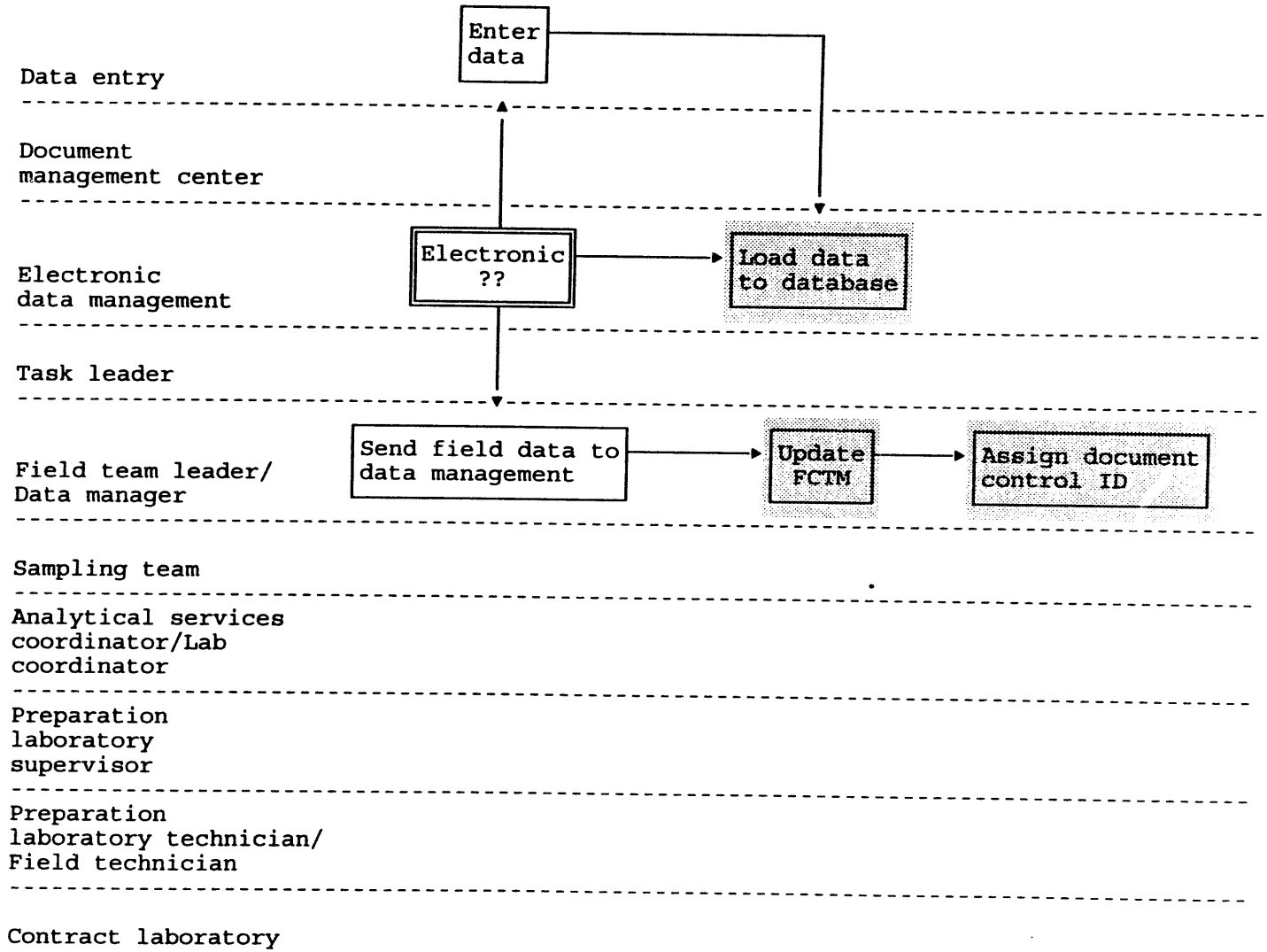


Fig. 4.11. Responsibility Matrix and Process Flow of Field Measurements.

ESD has a goal to complete sensitivity analysis demonstrating that the allowable deviations in data for computed daily potential evaporation are within ±10% of the true value for 95% of the time by the end of the second quarter of FY 94.

The following validation checks will be performed and corrective actions taken as noted:

- Except for the cases where data are missing as a result of the data collection functions, all data except rainfall will be derived from a similar day based on solar radiation and temperature or data from a nearby sensor will be substituted (i.e., WAG 4 meteorological station, Oak Ridge township). Rainfall will be taken from a nearby rain gage. Data missing as a result of data collection functions should constitute a short gap and should be derivable by examining trends from the ending and beginning values in the data files that occur on either side of the gap.

- Singularities in data with the exception of rainfall will be identified by the occurrence of one to three hourly points that deviate more than ±20% from data trends. Data will be removed and replaced with interpolated values except in the case of rainfall. Rainfall will be handled like missing data.

Meteorological reporting capabilities. In addition to the tabular files of the data and the before and after correction graphs supplied as part of the data validation procedures, the following reporting capabilities will exist at the time of initial data collection:

- the ability to extract from the data base selected ranges of data and place into SAS® data sets thereby providing the ability to produce predefined and ad hoc reports;

- monthly summaries of daily values with totals; and

- monthly plots of daily temperature (with max/min bars), relative humidity, windspeed and solar radiation.

The following reports and files will be available on an as developed basis as the system matures:

- annual summary charts in the U.S. Geological Survey format;

- the ability to generate wind vector coordinates from windspeed and direction data in the data base and produce windrose diagrams using SAS®;

- the ability to extract data and create ASCII files in the Terrestrial Ecosystem Hydrology Model format for daily max/min temperature, relative humidity, solar radiation, wind speed, and a sum of the hourly precipitation; and

- hourly and daily potential evaporation calculations utilizing both the Van Bavel and Priestley Taylor methods.

4.10 PROCESS FIELD SAMPLES AND MEASUREMENTS

Figure 4.12 summarizes the flow and responsibilities associated with the processing of field measurements. Upon return from the field, the CRRI FSTL will transfer the bar code reader to the IMG. The WAG 6 FSTL will transfer the bar code reader data to a 3.5HD diskette for collection by the DM. The data recorded in the reader or on the diskette will be transferred into a working file on the workstation. The system will validate the data against existing tables and value lists, and an error report will be generated. The fields that will be captured for CRRI are site, sediment type, location type, GPS identifier, and water depth. The fields that will be captured for WAG 6 are monitoring location, sample type, container type and size, analytes, and preservation type. In some cases, the data flagged by the error report may be acceptable because the data may have been keyed incorrectly into the bar code reader. Once errors have been corrected, the bar coded data will be loaded into the data base. The system will automatically change the sample status flag from "Planned" to "Collected" when the sampling date and time are loaded.

For CRRI, a Sample Collection Information report (Fig. 4.13) will be generated once the data are loaded and compared with the field logbook. Any necessary corrections will be made by the FSTL using an editing program. Once the information has been verified, a document control number will be assigned and entered into the data base. If needed, the report will be reprinted, signed by the FSTL, and labelled with the document control identifier.

The data base is amended by the FSTL/DM to reflect any correction or comments made on the FCOC/FAS. Samples that are lost, retired, "field only," or uncollectible will have the sample status flag set accordingly. When all of the updates have been entered, the CRRI FSTL will obtain the next preprinted document control identifier and enter this number into the data base. The FCTM will be printed and signed by the CRRI FSTL, and the preprinted document control identifier number will be attached to the first page.

4.10.1 Process CRRI Field Samples

Samples are transferred to the sample preparation laboratory for predetermined processing before shipment to the analytical laboratories. Figure 4.14 shows the responsibilities and flow associated with this process. Using an application program, the laboratory supervisor generates an LPTM to be used by the technicians who process the samples. The supervisor enters the sampling kit identifier that contains the samples to be processed. The application accesses the corresponding FCTM and task definition files to create a partial LPTM. The field sample identifier, preservative, sample type, laboratory matrix, and requested analysis is automatically incorporated for all samples. Samples not requiring further processing will have the field sample identifier repeated under the laboratory sample identifier column, and the processing date and laboratory container information marked out. Samples requiring processing will have the processing date, laboratory sample identifier, and laboratory container lot number left blank. The supervisor reviews the LPTM and corrects the information as necessary.

The laboratory supervisor directs a group of samples and the corresponding LPTM to a technician. Using the LPTM as a guide, the technician processes the field samples. If the technician creates a new sample via a processing step, the technician attaches the next preprinted sample label to the container and notes the identifier, date, and (optionally) the container lot number on the LPTM. The technician returns the completed LPTM to the

SAMPLE COLLECTION INFORMATION

CLINCH RIVER ER PROJECT		SAMPLE DATE:			FIELD COC ID:			
TASK:		LAKE ELEVATION:			FIELD NOTEBOOK ID:			
SAMPLE ID	SITE	SAMPLE TIME (MILITARY)	SEDIMENT TYPE	WATER DEPTH	SAMPLE COLLECTION DEPTH	LOCATION		FIELD NOTEBOOK PAGE
						TYPE	GPS ID	
SEDIMENT TYPE: CM = Cohesive Mud; SM = Soft Mud; SDM = Sandy Mud; SG = Sand and Gravel; SS = Submerged Soil								
LOCATION TYPE: CV = Cove; EM = Embayment; MC = Main Channel; RB = Right Bank; LB = Left Bank								
Completed by:							Date:	
Distribution:								

SCI Rev 1 16AUG93 Document ID:

Fig. 4.12. Sample Collection Information Form.

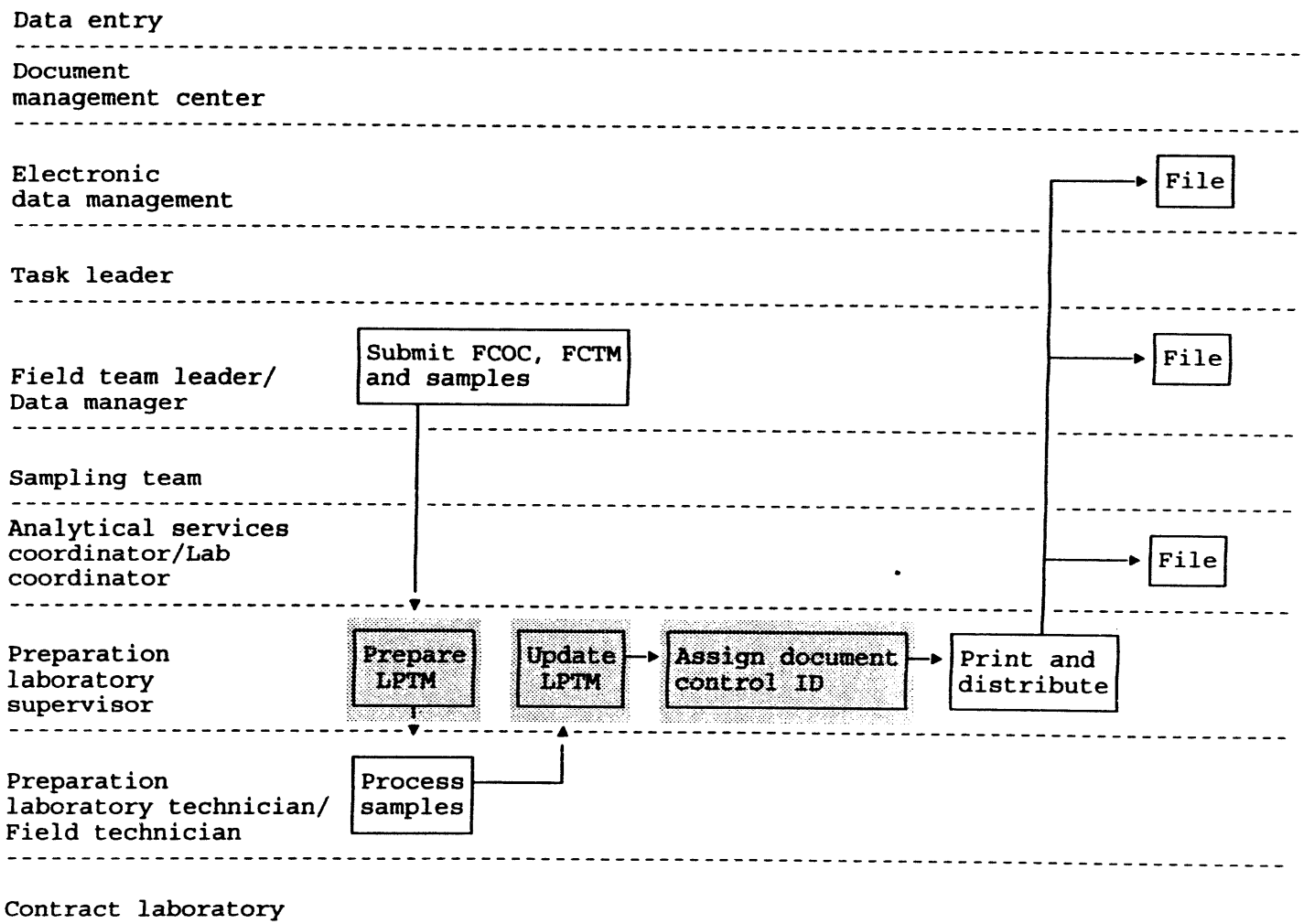


Fig. 4.13. Responsibility Matrix and Process Flow of CRRI Field Sample Processing.

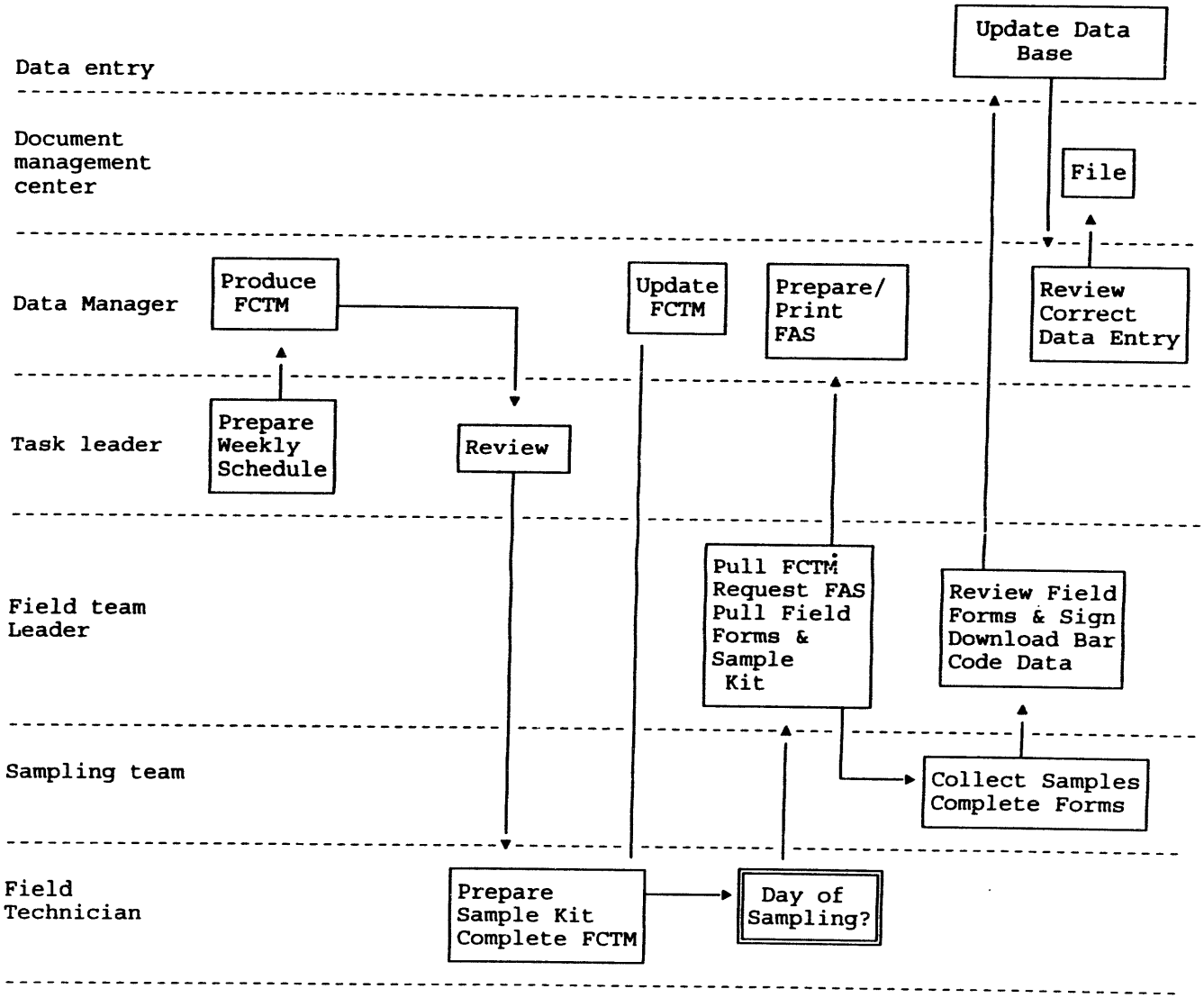


Fig. 4.14. WAG 6 Responsibility Matrix and Process Flow of WAG 6 Field Sample Processing.

laboratory supervisor.

The laboratory supervisor enters the sample identifier, processing date, and container lot number into the data base. When all of this information has been entered, the supervisor obtains the next preprinted document identification number and enters that number into the data base. The supervisor prints the LPTM, signs the report, and attaches the document control number to the first page. The control number will be automatically printed on continuation pages. The data base fields and records corresponding to this form are then under configuration control. The LPTM becomes part of the daily file that is ultimately submitted to the document management center (DMC). The document control number will be associated with all samples contained on the LPTM.

4.10.2 Process WAG 6 Field Samples

Samples are transferred to the staging area for processing as needed before shipment to the analytical laboratory. Figure 4.15 shows the responsibilities and flow associated with this process.

WAG 6 will not be using a preparation laboratory. The composite and preserved samples will be taken to the staging area for processing before shipment. Field forms will be used to note the composite process. Upon completion of the compositing and preservative mixture, the STL will notify the FTM and will return the field forms for the FTM's review. The DM will retrieve all field forms daily. When a composite has been done or when samples are to be shipped immediately, the FTM will notify the DM and a COC will be prepared.

4.11 LABORATORY ANALYSIS OF SAMPLES

Samples collected from the field or created in the preparation laboratory/staging area are sent to contract laboratories for chemical, radiological, or physical analysis. The following sections explain in detail sample transfer, sample receipt, data review, and tracking of analytical services.

4.11.1 Sample Transfer

Figure 4.16 shows CRRI process flow and responsibilities associated with transferring samples to the analytical laboratories. The CRRI ASC routinely queries the data base to tally the number and type of samples in the preparation laboratory awaiting shipment to an analytical laboratory. As needed, the ASC/DM assigns samples to an SDG. The SDG contains 20 or fewer samples and is the unit used to identify a group of samples sent to an analytical laboratory. When an SDG is complete, the CRRI ASC notifies the appropriate task leaders of the upcoming shipment, prepares a shipping order, completes a request for services, and generates a laboratory COC (LCOC) to accompany the samples to the laboratory.

If any WAG 6 samples are to be shipped immediately, the STL will note this information by placing an asterisk in the left margin of the FAS, make a copy of it, stamp with the word "copy" in red on the form, and forward the copy to the DM for a COC to be printed. When held or composited samples are ready for shipment to the analytical laboratory, the FTM will notify the DM of the sample identifiers and the FTM badge number. Figure 4.17 shows the WAG 6 process flow and responsibilities associated with transferring samples to the analytical laboratories.

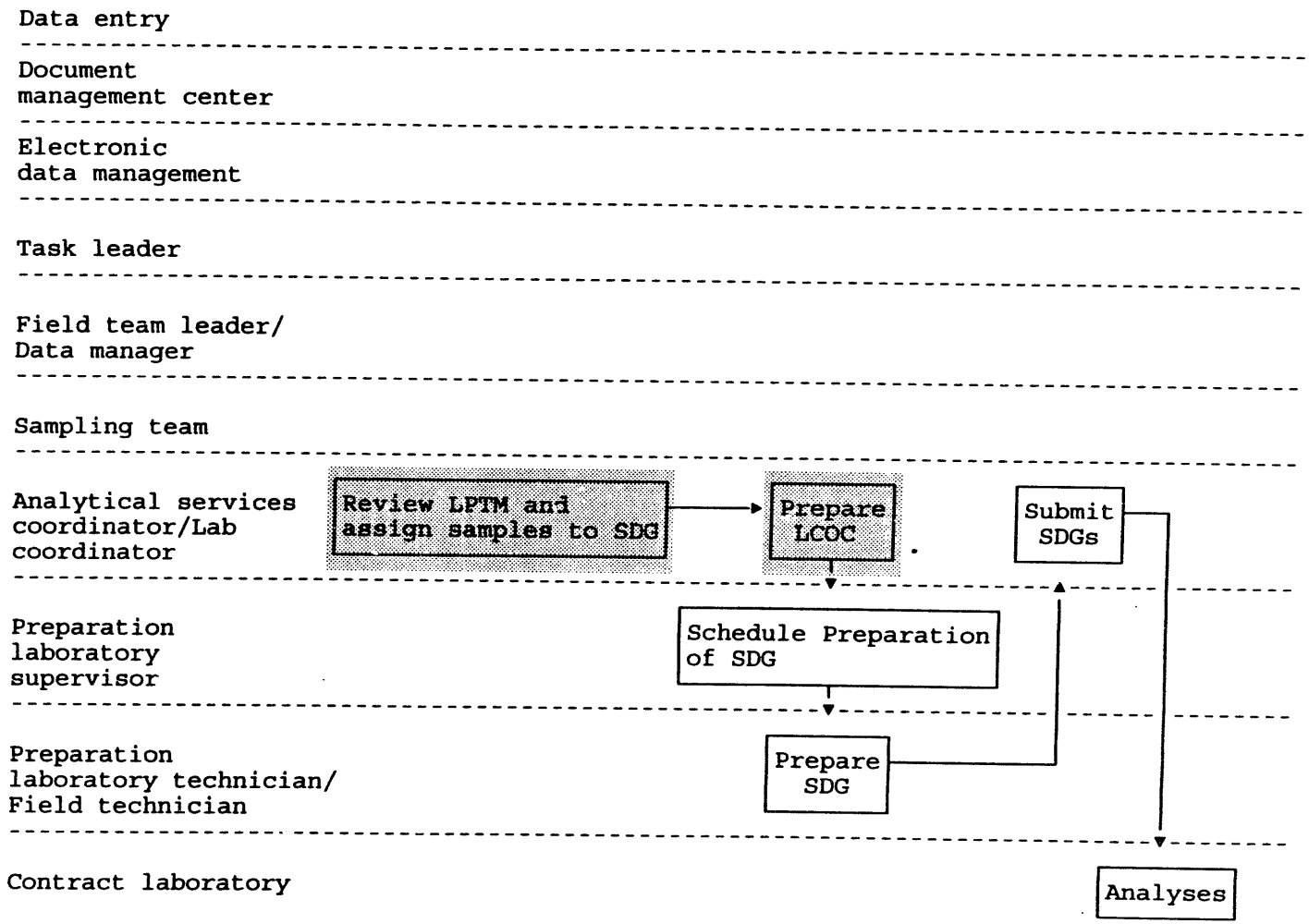


Fig. 4.15. CRRI Responsibility Matrix and Process Flow of Transfer of Samples to Laboratories.

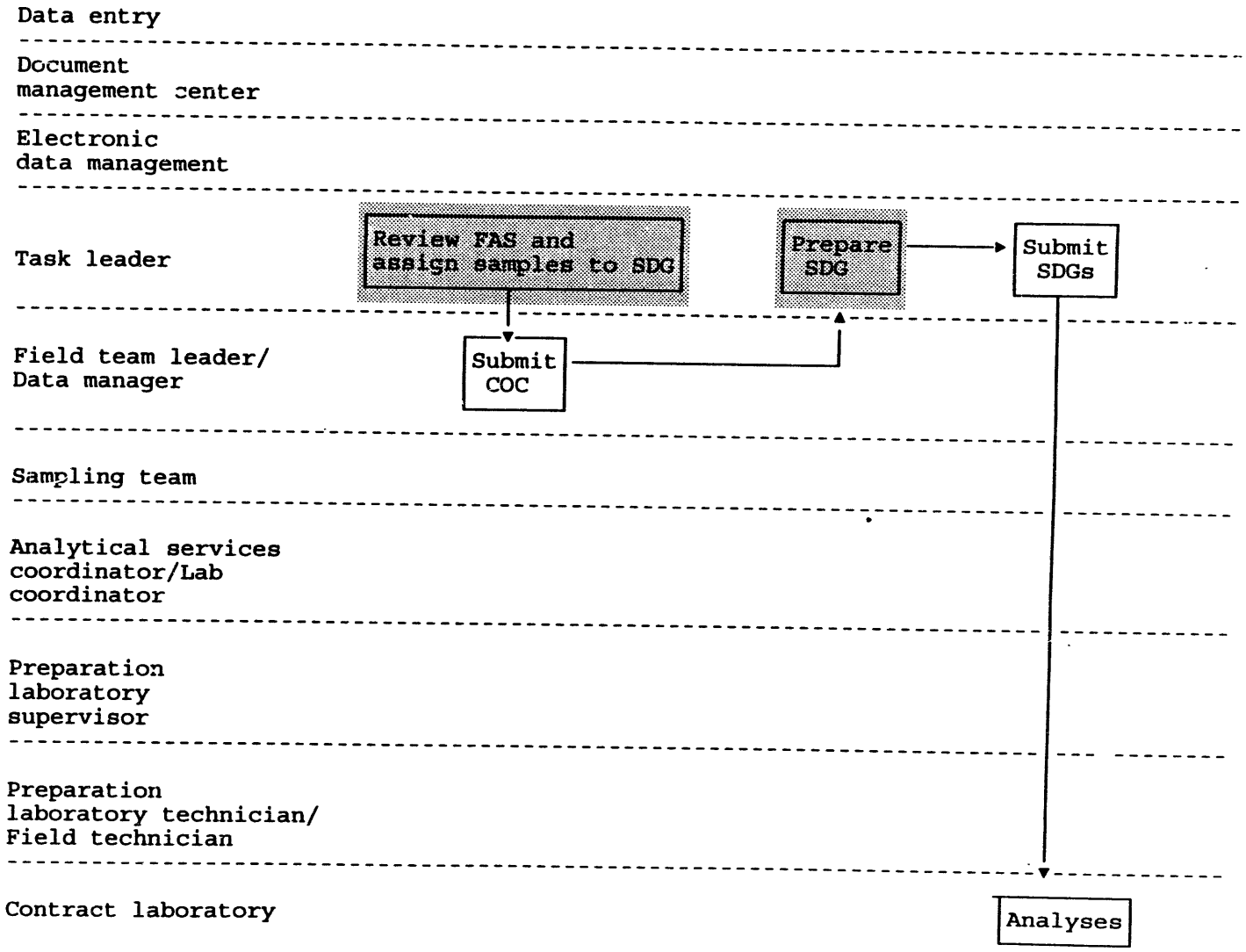


Fig. 4.16. WAG 6 Responsibility Matrix and Process Flow of Transfer Samples to Laboratories.

LAB CHAIN OF CUSTODY

CLINCH RIVER-ER PROJECT				LAB COC ID:					PAGE OF	
LAB CUSTODIAN:				PROCESSING TEAM:						
SAMPLE ID	SAMPLE DATE	SAMPLE TIME	SAMPLE TYPE	SAMPLE LOCATION	CONTAINER		PRESERVATIVE	REQUESTED ANALYSIS	TRANSFERRED FROM FLD COC ID	REMARKS
					TYPE	VOLUME				

SAMPLE TYPES: RB = Rinse Blank; FB = Field Blank; SPK = Spike; TB = Trip Blank; FLD = Field Sample; FD = Field Duplicate; SP = Split; CP = Composite; VCP = Vertical Composite

CONTAINER TYPES:

PRESERVATION: A = HCL to pH < 2; B = HNO_3 to pH <2; C = H_2SO_4 to pH < 2; D = NaOH to PH > 12; E = Other (Specify)

REQUESTED ANALYSIS TYPES:

LABORATORY:		DATE SUBMITTED TO LAB:		SDG ID:	
Relinquished by:	Date:	Type:	Received by:	Date:	Time:
Relinquished by:	Date:	Type:	Received by:	Date:	Time:
Relinquished by:	Date:	Type:	Received by:	Date:	Time:
Sample Disposed by:			Date:	Time:	

LCOC Rev. 4 01JUL93 Document ID:

Fig. 4.17. Laboratory Chain-of-Custody Form.

The LCOC/COC (Figs 4.18 and 4.19) is generated by the ASC/DM using a data base application program. A LCOC/COC contains samples from one (and only one SDG), but a SDG may require multiple LCOC/COCs. The ASC/DM enters the SDG, a LCOC/COC identifier, laboratory name, shipping date, shipping contract number, shipping order number, shipping container number, and the identifiers of the samples to be grouped into the SDG. The sample shipment date is the date a sample is shipped to the analytical lab. An SDG Shipping Container Number is the number on the container that was used to transport the samples to the contract laboratory. The remaining information on the LCOC/COC is obtained from the data base.

For CRRI, the ASC assigns a document control identifier and prints the LCOC. The LCOC is sent to the preparation laboratory where the appropriate samples are prepared for shipment. The ASC also faxes the request for services and the LCOC to the contract laboratory to notify them of the upcoming shipment. The LCOC/COC accompanies the samples until custody is transferred to another COC form.

For WAG 6, the FT packages samples for shipment and records the shipping number on the COC. The DM assigns a document control identifier and prints the COC. The WAG 6 document control identifier is the same as the COC identifier. After the WAG 6 FT signs the COC, two copies will be made, one for the daily project file, and one to be sent to the LC. The LC will be responsible for faxing a copy of the COC to the contract laboratory. The COC accompanies the samples until custody is transferred to another COC form.

The CRRI preparation laboratory packages the samples for shipment to the analytical laboratory. The preparation laboratory supervisor/FSTL is responsible for ensuring that custody seals are attached to the sample containers before they are transferred to the laboratory. The technician who packs the shipping cooler completes the custody seal and attaches it to the shipping container in such a way that the seal must be broken if the shipping container is opened or tampered with. The technician retains a copy of the shipping order and follows standard company procedures for submitting the customer copy of the shipping order to the billing department. The copy of the shipping order is submitted to the project file. When the packaging is completed, the CRRI technician notifies shipping about the sample delivery, and the WAG 6 samples are taken directly to the shipper.

Before they are transported to the laboratory, all shipping containers must be checked for radiological contamination and tagged by Health Physics (HP). If samples will be transferred to an off-site analytical laboratory, the CRRI preparation laboratory supervisor will ensure that a certification of nonsecondary contamination is completed as needed and that the samples are classified nonhazardous according to U.S. Department of Transportation (DOT) and EPA shipping regulations. The supervisor/FT is also responsible for ensuring that a shipping order is included with other sampling documentation recorded in the field. The CRRI preparation laboratory supervisor ensures that a legible copy of the HP survey tag is sent to the ASC, as well as a copy of the shipping order after signature by Energy Systems shipping personnel. The WAG 6 FSTL will prepare the documentation for shipping to the analytical laboratory in accordance with DOT regulations and the requirements of the selected laboratory.

WAG 6 - CHAIN OF CUSTODY

WAG 6				Sequential No:				Page ___ of ___	
Sample Team Leader:				Sample Team:					
Sample Location	Sample Date	Sample Time	Sample Type	Sample	Container Type	Container Volume	Preservative	Request Analysis	Remarks

SAMPLE TYPES: RB = Rinse Blank, FB = Field Blank; TB = Trip Blank; FLD = Field Sample; , MS/MSD

CONTAINER TYPES: P = High Density Polyethylene, G = Glass, T = Teflon

Preservative: A = HCI to pH < 2; B = HNO_3 to pH < 2; C = H_2SO_4 to pH < 2; D = NaOH > 12; E = Ohter (Specify)

Laboratory:	Date Submitted to Lab:	SDG ID:

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date	Time:	Received by:	Date	Time:

Sample Disposed by:	Date:	Time:	Air Bill #:

GW-COCF
10/5/93

COC-01

Fig. 4.18. WAG 6 Chain of Custody.

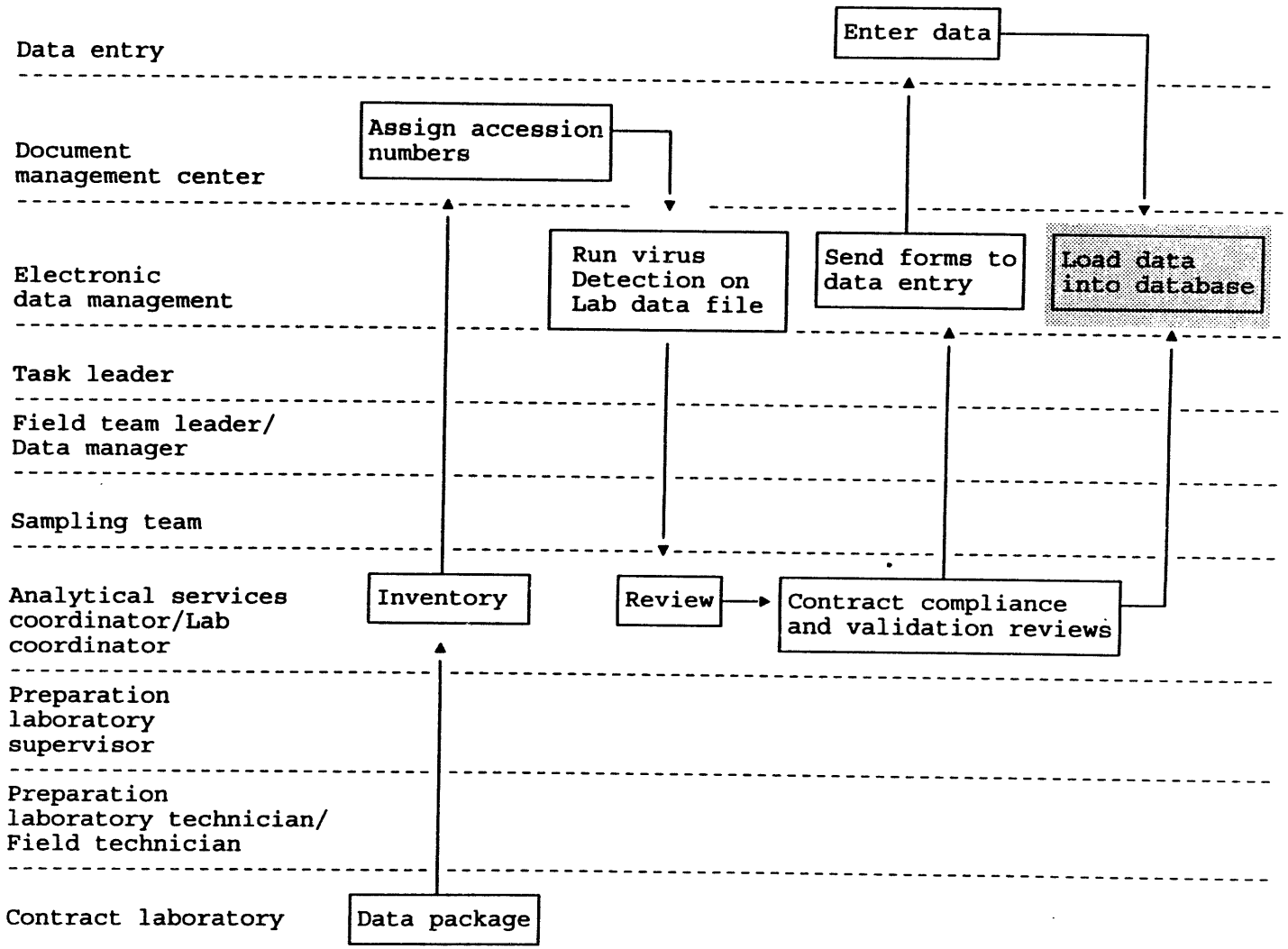


Fig. 4.19. Responsibility Matrix and Process Flow of Receipt of Data from Laboratories.

4.11.2 Laboratory Sample Receipt

When the samples arrive at the laboratory, the laboratory staff member signs the shipping manifest. In addition, the laboratory staff will:

- Verify that the airbill number for the shipment and the number recorded on the LCOC/COC match.
- Verify the number of samples received, sample identifiers, and requested analyses by checking the LCOC/COC and sample labels.
- Note on the LCOC/COC the condition of the samples and temperature of the container at receipt.
- Record the time and date of receipt and sign the LCOC/COC.
- Assign laboratory identifiers to the samples and initiate laboratory internal COC.
- Return a copy of the signed and dated LCOC/COC with a letter that states the laboratory identifier for each sample cross-referenced to the project sample identifier, analyses planned, and any problems including their resolution.
- Retain and file the shipping manifest.
- Retain the original LCOC/COC for return when samples are disposed of or with any remaining samples.
- Retain and file a copy of the signed and dated LCOC for inclusion in the data package.
- After the laboratory verifies receipt of a sample shipment, the ASC/LC will send all LCOC/COCs, CRRI request for services, and sample shipping receipts to the APO.

4.11.3 Data Review

Each laboratory will review and, if necessary, qualify their data as discussed in the LQAP. The LQAP will contain a discussion of data evaluation procedures for each analytical method, as well as for each entire data set. The process for data review and approval must be outlined, as well as the process for identifying the person with authority to release the data. Each SOW requires that the laboratory is responsible for ensuring 100% agreement between the hard copy and electronic deliverables when both are required.

4.11.4 Tracking of Analytical Services

Sample tracking responsibilities involve tracking sampling and analysis from the time of approval of the SOW to the disposal of the samples. Maintaining contact with the laboratory regarding the progress of analysis and providing early warning of potential exceedances of holding times or delays in delivery of data packages is essential. With assistance from the APO and IMG personnel, the ASC/LC and CRRI data coordinator (DC) track the samples, results, and associated documentation and resolve any problems. Periodic printouts are available that will track the placement of the laboratory SOWs, the location and status of

individual samples (e.g. planned, at preparation laboratory, at analytical laboratory, undergoing validation), and the resolution of exceptions.

The analytical laboratory provides monthly progress reports (MPRs) to the APO and to the ASC/LC. The MPRs summarize laboratory throughput and quality issues. The laboratory must address any problems identified immediately, and work by the laboratory may be stopped while problems are resolved. Follow-up audits and surveillance may be performed. In addition, laboratories approved by the APO must successfully participate in evaluations over the duration of its ER work, including periodic audits.

4.12 RECEIPT OF LABORATORY DATA DELIVERABLES

All data packages (printed reports and electronic media) from the analytical laboratories are sent to the ASC/LC. Process flow and responsibilities are summarized in Fig. 4.20. The ASC assigns the data package to a DC within the ASG. The DC/LC takes the data package and electronic deliverable to the DMC where unique accession numbers are placed on each. The DC/LC logs in the receipt of the packages and, if necessary, makes photocopies of the entire package. The DC transfers the electronic deliverable to the IMG/DM, where a computer readable copy of the electronic deliverable is made. A virus detection program will be run against all electronic deliverables before loading them onto the IMS. The original data package and electronic deliverable are then placed in the project files. The CRRI DC delivers the photocopy of the data package to a data inventory specialist for inventory. The WAG 6 LC will inventory the hardcopy data package for completeness.

4.13 COMPLIANCE SCREENING

Compliance screening is a review of the data packages to verify that the field and laboratory meteorological project deliverables. Review of laboratory deliverables includes a review of data to verify that the laboratory met the requirements of the analytical method and SOW deliverable requirements. The review also includes the deliverables required from the field effort and verification that all are present, as required by the project. Completed and reviewed laboratory and field project deliverables go to the data validators for validation.

4.13.1 Field Data

The daily field data package shall contain, as applicable the FCOC, LCOC, COC, sample schedule form, sample processing information form, field sample collection information form, site maps, field data forms, copy of radiation survey tag, I-CHEM form with lot number, sampling checklists, and a copy of the field logbook pages. The DC/DM shall inventory each daily field data package and verify that all pertinent information is included, using a field data package checklist.

4.13.2 Laboratory Data

The inventory specialist/LC completes the appropriate inventory checklist and notes all exceptions (e.g., items that are missing, incorrect, or incomplete). If the data package is complete and without problems or mistakes, the inventory specialist/LC attaches notes, checklists, and forms. The CRRI inventory specialist returns the package to the DC. If any

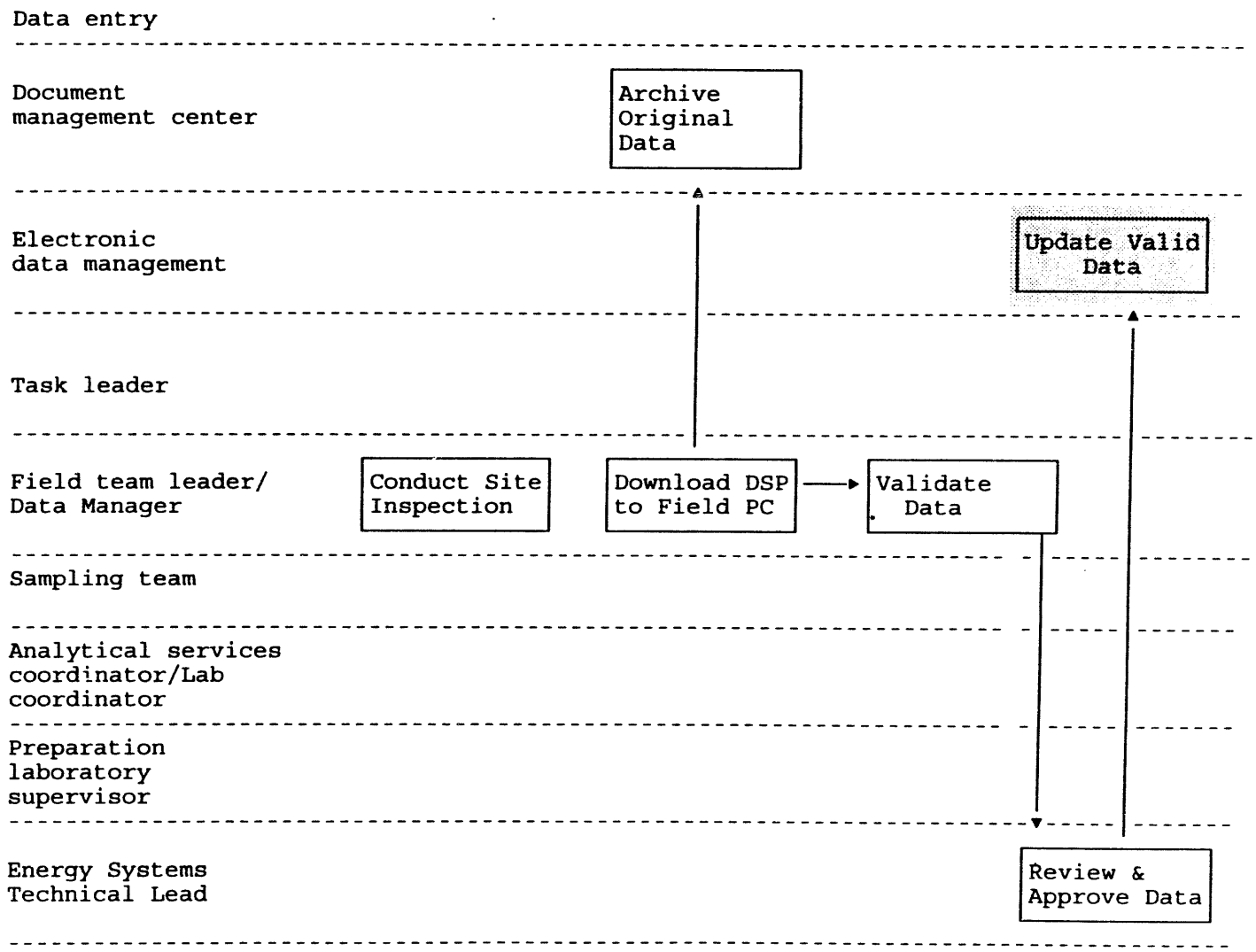


Fig. 4.20. WAG 6 Responsibility Matrix and Process Flow of Meteorological Monitoring.

exception items are found during the review process, the verifier identifies the item(s) in the notes and photocopies the page(s) necessary to completely document the exceptions. The data inventory specialist/LC initiates a project exception report (PER)/NCR and forwards it and the data package to the DC pending resolution of the PER. The WAG 6 LC will initiate and track the NCR to resolution.

4.14 DATA VALIDATION

The validation process is a technical review of the data. The intensity of the review, the types of checks performed, and the degree of reviewer independence from other parties involved are project specific. At a minimum, validation includes checking the accuracy of data transfer, interpretation of raw data, and laboratory review; identifying factors from compliance screening that affect data values; flagging data based on factors external to the laboratory; and certifying the data. Validation will also include reviewing the reasonableness of the data in terms of a model, related sites, or other criteria.

4.14.1 CRRI Field Data Validation

Field data validation shall be conducted according to standard operating procedures. The field data review consists of two parts. The first part, a field sampling and documentation review, occurs as soon as possible after sampling. The second part consists of a review of the field QC samples when the data are available from the analytical laboratory.

Qualified personnel conduct and document a review of field sampling activities as soon as reasonably possible after the completion of daily field sampling activities by the responsible field personnel. Independent verification of those items listed on the field data validation checklist will also be performed by a field validator, an individual who is not a member of the sampling team. If appropriate, field data are flagged, as indicated in the checklist.

If the reviewer identifies any departures from the SAP, the reviewer meets with the QA/QC Coordinator. The reviewer recommends as to whether the departure is serious enough to be considered a variance requiring generation of a PER. The QA/QC Coordinator reviews the field logbook. If there is agreement that a PER is not required, the QA/QC Coordinator records concurrence that a PER is not required in the logbook and signs and dates the entry. If agreement cannot be reached, the departure is presented to the program manager or project manager for resolution.

If a PER is required, the reviewer initiates a PER (see Sect. 4.19). If necessary, analysis of affected samples is canceled by the ASC. The reviewer is required to document the effects on the sample through the PER process. When the ASC receives a copy of the approved PER/NCR, sample analysis will be halted by sending a fax to the laboratory and telephoning the laboratory. The ASC follows up the fax and telephone call with a letter confirming the cancellation.

When the analyses are completed by the laboratory, the field QC results are examined by the analytical data validator.

The data validator documents his or her findings in notes or on worksheets and flags copies of logsheets with appropriate qualifiers. When the review is completed and the

qualifiers have been recorded on the copies of the logsheets, the data validator signs and dates the notes to certify that the review has been conducted and transmits all documents to the DC. The DC or designee delivers copies of the logsheets containing the qualifiers entered by the data validator to the data entry clerk (DEC).

Deliverables that should result from the field sampling review follow.

- Part 1

  -Field Sampling Review Checklist with supporting information

  -PER

- Part 2

  -Discussed in Analytical Data section

4.14.2 WAG 6 Field Data Validation

Analytical laboratory data validation requirements, criteria, and procedures are sufficiently developed to be generally applied across projects with reasonable confidence. Field data validation requirements, criteria, and procedures are not, however, as well developed today. Active efforts are underway to develop generally applicable field data validation requirements, criteria, and procedures for use across ER projects. These will be incorporated in WAG 6 when they become available. In the interim, field data validation and verification are described in the following paragraphs.

WAG 6 field data will exist in two formats and in field logbooks. The first format is electronically stored data collected through monitoring events; the second is the field forms coupled with bar code equipment.

The STLs will be responsible for downloading and performing an initial screening of the monitoring data. The STL will complete missing data gaps and resolve obvious erroneous data using the field logbook. The STL will then process the data through the appropriate verification software (e.g., GPS data and bar code verification and loading). An assigned Energy Systems reviewer will verify the data by a visual check. The STL will be responsible for correcting the data according to the reports from the verifier review.

The FTM will perform an initial visual screening of all field forms for completeness. The STL will resolve any nonconformances identified by the FTM. The appropriate, assigned QA and/or technical personnel will verify the information uploaded against the written data on the field forms. Any nonconformance will be resolved through a joint effort of the STL, FTM and DM, if necessary.

4.14.3 Analytical Data Validation

Computer checks of available QC information shall be evaluated according to method criteria by the IMG and the ASC/LC. Results of these checks will be compared with other available electronic checks and data validation reports. Duplicates and spikes will be evaluated electronically for all data, as applicable, so that assessments of precision and accuracy may be

made. Data not within established control limits will be reported as nonconformances and will be flagged as such. These checks shall include, but not be limited to,

- a summary of percent recoveries for all surrogates and spikes to evaluate accuracy,
- a summary of holding times,
- a summary of duplicates to evaluate precision,
- a summary of blanks to assess contamination levels,
- a summary of project required detection limits versus reported detection limits, and
- a summary of laboratory control samples.

Comprehensive validation will be performed initially on approximately 10% of the data packages. The data packages to be validated will be designated by ASC/LC. The DC/LC will transfer the appropriate data package, applicable electronic reports, worksheets, and guidelines to the validator, as appropriate. Representative sample data are verified by manual calculations. Documentation of these manual checks will be placed in files with the associated analyses, and copies will be sent to the DMC. If problems are found during validation of the first data package, each succeeding data package is validated until the problems are judged to have minimal effect on overall data quality.

As part of the data validation process, the validator will identify any exceptions. If a exception is identified, the validator will generate a PER/NCR. Handling of PER/NCRs is discussed in Sect. 4.19. Review and validation deliverables include:

- a data review and validation package
  - A batch narrative summarizing, by analysis and/or method type, the problems found that affect data quality for the batch. Each narrative shall include the typed name, title, and address of the data reviewer as well as his or her signature and the date. Each narrative shall also state which validation procedure was used.
  - A list of data qualifiers and their meanings for use in data evaluation.
  - Copies of data reporting forms (CLP Form 1 or equivalent, stamped "Copy") with validation flags.
  - A completed checklist for each batch that lists those QA/QC items that have been reviewed and/or validation worksheets, as applicable.
  - The closed PER/NCR that applies to the batch, if applicable.
- Electronic entry of validation flags for each sample and analyte.
- A summary narrative by analysis/method and type/matrix/laboratory of the problems that affected the data quality for that particular method/matrix/lab. Each narrative shall

include the name, title, and address of the data reviewer as well as his or her signature and the date.

After verifying the completeness and integrity of the documentation, the data validator signs and dates the completed data review/validation report and associated worksheet forms and transmits the data package and review documentation to the DC. The DC receives and logs the receipt of the validated data package with the associated review/validation report, completed worksheets, and any additional QA/QC documentation (i.e., PER/NCR).

4.15 DATA ASSESSMENT

Data assessment will be formally conducted as the final component of the comprehensive data validation process, although the process of assessing the data actually begins when the data are received from the laboratory. This component involves the integration and evaluation of all information associated with a result. Individual application programs are developed for data assessor use. Documentation provided to the data assessor includes

- a field data package inventory checklist;
- a field data package;
- an analytical data package inventory checklist;
- an electronic data verification output;
- an analytical screening reports;
- an analytical data validation report, as applicable;
- a summary of precision information from the data base; and
- a summary of accuracy information from the data base.

The data assessor is generally the principal investigator responsible for comparing the data to the original assumptions and integrating all relevant information. Documentation will be provided to the responsible personnel as soon as available, so that the conceptual model may be evaluated and modified as needed. The data assessor shall evaluate the field and laboratory data and supporting documentation and assess the reasonableness of the data as compared with (1) the conceptual understanding of the system, (2) data from similar sites, (3) historic data, (4) trend analysis of the concentration of the analytes, or (5) other criteria, based on the reviewer's professional judgement. Sensitivity, precision, accuracy, representativeness, completeness, and comparability (SPARCC) for field and analytical data shall be reviewed and compared to DQOs. The total error associated with the sample data shall be assessed and documented. Data that do not support project DQOs shall be identified and a justification for their unacceptability documented.

The data assessor collects all the data that have been generated—historical and newly collected—to review and analyze them according to SPARCC parameters to determine usability. He or she will also use statistical techniques to evaluate environmental data and to assist in designing appropriate sample plans based on the data. Interpreting accuracy, precision, and completeness can be key in understanding the significance of the reported values and in assessing the confidence associated with any decision. When data assessment is completed, the following characteristics of the data should be known:

- Data authenticity

  Nonauthentic data may originate from either intentional or accidental reporting of incorrect data. Data entry errors, transcription errors, calculations errors, software failures, poor recording procedures, inadequate training, and lack of management oversight may result in the accidental reporting of incorrect data. Intentional reporting of nonauthentic data may result from unauthorized access to samples and/or sample data, lack of ethics, or manipulation of logbooks, worksheets, or instrument listings.

- Data integrity

  Data have integrity if they are reported as the results of procedures that ensured that proper analysis and sampling methods were selected and followed correctly, that results were not compromised as a result of intentional or accidental reporting of incorrect values, and that documents were maintained that demonstrate the procedures used.

- Validation and certification

  The data validation process involves an evaluation of the data to determine whether data meet the required criteria. If the data meet all the requirements of the DQOs as stated in the SAP, QAPjP, and the requested method, then the data may be certified. The data may also be certified with exceptions.

- Data usability

  If the data meet the DQOs, then the data are usable.

- Outliers

  Outliers may be valid or may result from unusual loss or contamination, transcription errors, dilution errors, sample misidentification, bad reagents or standards, calculation errors, faulty instruments, incorrect application of the analytical method, system malfunctions and loss of sample integrity.

- SPARCC

  Sensitivity is the capability of methodology or instrumentation to discriminate between samples having differing concentrations of analytes. Sensitivity is defined by the limit of detection, limit of quantitation, instrument detection limit, and the method limit of detection.

  Precision is the degree of mutual agreement between independent measurements made under specified conditions. Standard deviation, relative standard deviation, and relative percent difference are used to express precision.

  $$RSD = CV = 100 \text{ (standard deviation/mean)}$$
  $$RPD = 100\ [(X_1 - X_2)/((X_1 + X_2)/2)]$$

  Accuracy is the closeness of agreement between an observed value and an accepted reference value. When applied to a set of observations, accuracy will be a combination

of a random component and a common systematic error component (bias). Bias is calculated as

$$B = x_t - T \quad \text{or} \quad B = (x_s - x_u) - K$$

where x_t = measure value for reference sample,
x_s = measure value for spiked sample,
x_u = measure value for unspiked sample, and
K = known value of the spike in the sample.
T = known value for reference sample

Percent recovery may be expressed as the following:

$$\%R = 100\ (x_t/T), \text{ or } \%R = 100\ (x_s - x_u)/K$$

Representativeness expresses the degree to which the data actually reflect the analyte or parameter of interest at an environmental site.

Completeness is a measure of the amount of valid data obtained from the analytical measurement system. It is typically expressed as the total number of samples taken for which acceptable analytical data are generated, divided by the total number of samples collected and multiplied by 100.

Comparability is the confidence with which one data set can be compared to another data set produced by different laboratories. The use of accepted methods, standard operating procedures, and participation in intralaboratory performance evaluation testing demonstrates comparability.

A major objective of data assessment is to achieve and maintain the highest standards of quality in all areas. With respect to data analysis and data evaluation, the program for review of these activities and the associated responsibilities are defined in the QAPjP. These plans should describe the overall assessment program to be implemented. The Program Manager is responsible for ensuring that a planned, executed, and documented assessment program is implemented for all activities. The QA/QC officer is responsible for administering the assessment program. Assessments may be classified as self-assessments or independent assessments and are performed, reported, and verified for corrective action in all activities that fall under the responsibility of each data user. The assessment program should include both internal and external audits and surveillances.

Through the assessment program, authorized personnel promptly identify and correct conditions adverse to quality. The causes of these conditions are properly documented and reported to management. Conditions adverse to quality are defined as conditions that exceed predetermined acceptability limits (the number deviating from prescribed methods) that fail to meet performance requirements, or that fail to meet customer or regulatory requirements and expectations. Typical reasons for corrective action include: nonconformances, occurrences, management reviews, audits, surveillances, and problem investigations.

Data used for RCRA and CERCLA assessments must meet stringent QA/QC criteria. Historical data must be screened to ensure that the necessary QA/QC criteria have been met and that any deficiencies are clearly identified. In addition, it must be verified that the

procedures used to convert data from media and formats into formats used by analysts have not compromised the data. Software QA and application program QA and documentation must apply to the control of software applications.

Under this task, data analysis personnel will work with site personnel to identify all data that are potentially relevant to the current study. Once a list of these data has been compiled, the DC will consult with the project managers and project scientists to identify those data sets and base maps that should be obtained. These data will be requested, downloaded, and reformatted, as appropriate, to perform analysis. Links will be created between map information and attribute data. Upon receipt of data from the IMS, staff scientists will document their acceptability by completing a data base checklist.

During data analysis, team data analysts retrieve specific subsets of data from the IMS data base for use in determining chemicals of concern, in comparing concentrations to background levels and regulatory limits, and in performing risk assessments and modeling activities. A GIS is used for the analysis, manipulation, and display of coordinate data, as well as for the linkage of spatial data to attribute data from the validated centralized data base. Spatial data sets are categorized and stored as cartographic coverages or thematic layers representing the geometry and shape of different geographic objects. The source data may be in hardcopy form requiring digitization, or they may be in digital form and require transformation into the GIS structure. The collection history and methodology are documented along with the source data characteristics (such as scale, resolution, map projection, and geographic area) and the digitization and/or transformation steps. Spatial data are used in analysis to perform spatial analyses, plume modeling, land use mapping, volume calculations, and chemical-nature and -extent contouring.

All data reports and listings presented in technical reports are computer generated, using application programs (following software QA procedures) that access and summarize data contained in the validated data base. The validity of application programs will be entered into the project files. If appropriate, validity will be demonstrated through successful performance of benchmark applications. Widely accepted commercial software (e.g., Lotus) will not require validation; however, successful performance of derived applications, such as spreadsheets or reports must be documented in the project file. All data summaries, maps, reports, application programs, and data base files are indexed and stored in the project file. As a result, reports and summaries can be successfully replicated. Relevant data from the data base will then become available to regulators and to other internal and external users.

If the data appear acceptable by all criteria previously described, they are examined for spatial and temporal consistency. This examination consists of plotting concentrations of selected analytes in space, time, or frequency distributions, as appropriate for the data. Analytical results that appear out of place in the plots are examined for problems in sampling, analysis, or reporting. This type of analysis can identify incorrect measurement units, misplaced decimal points, or other transcription errors that might otherwise remain undetected. Data are corrected or deleted, depending on the problem identified, and appropriate changes are initiated and documented. If no problem is identified, the data are used in the analysis. Data that do not fit expected patterns may represent real conditions that are important in understanding the site.

4.16 QUALIFICATION OF DATA

Data qualifiers, flags, and remarks become necessary when the data to be reported need to be qualified or described in some way. Every instance of the use of a qualifier, flag, or remark use is an effort to best describe the circumstances and quality of that piece of data and is based on all the information available to the chemist or reviewer. Flags may be assigned based on information from four different sources; laboratory data review, compliance screening, data validation, and data assessment. Whether or not the flags are extrapolated to other data depends on the reason for assignment of the flag.

Flag assignments are based on method QC, sample QC, and other QC factors. Method QC consists of the analyses necessary for setting up for the sample analyses and the analyses that are common to the sample batch. These include instrument tuning (for gas chromatography/mass spectrometry analyses), calibration standards, blanks, LCSs, spikes, and duplicates.

Sample QC criteria are specific to each sample. For organic analyses, these include internal standards, surrogate spikes, and the identification and quantitation of target analytes and tentatively identified compounds. Inorganic sample QC includes inductively coupled plasma serial dilutions, furnace AA duplicate injections and postdigestion spikes, and the identification and quantitation of target analytes. Flags would not be extrapolated to other samples unless identical quality problems were evident.

Other QC consists of additional analyses that are necessary to assess the field and laboratory procedures and to use the data. This includes container certifications, field blanks, field replicates, detection limit determinations, holding times, precision and accuracy determinations, and performance evaluation sample analyses. The effects of each of these QC items will be evaluated to determine whether sample flags could be applicable to other samples.

The DEC enters the qualifiers into the data base via data entry screens. The DEC verifies entries by performing a 100% review of electronic entries and the hardcopy logsheets or by performing double data entry and running a compare program. The DC/LC files all field data documentation.

4.17 DATA BASE VERIFICATION

Data base verification involves an evaluation of the project data base to ensure accountability, traceability, correctness, and completeness. Verification identifies errors that can be corrected. Accountability checks include confirming that data collectors and generators are identified and reviewing data transfer and data entry documentation. Traceability of the data base entries to hardcopy sources and to electronic deliverables will be documented. Hardcopy sources include all field data sheets and sample collection forms, analytical data packages, and data validation reports. Correctness involves verification of data transfer processes, double data entry for nonelectronic analytical data, and comparison of data base values with the source. Completeness checks will verify that all required descriptors for both samples and individual results are present, correct, and consistent with applicable plans and procedures, and/or OREIS formats. These checks will review locations, coordinates, sample identifiers, units, dates, laboratory sample identifiers, methods, parameter names, result

formats, laboratory flags, and validation flags, among others, as appropriate. Deliverables that result from the data verification process could include the following:

- comparisons of sample tracking information entered by program personnel with corresponding data entered by the analytical laboratory,
- a summary table of the number and type of samples collected for each monitoring event, and
- a summary table of the number and type of samples collected for each site.

4.18 INVENTORY OF PROJECT CASE FILES

The DC/records manager performs an inventory of each complete case file. Each case file is identified by a previously assigned accession number. All copies of documents shall be complete and legible. Original documents that include information relating to more than one case or sample shall be filed by lowest sample number. The copy (or copies) shall be placed in the other applicable files and marked "Copy" in red ink. To provide document accountability of the completed file, each item in the case file shall be inventoried and assigned a serialized number. A table of contents shall preface each file.

4.19 TRACKING PROGRAMMATIC EXCEPTIONS

An exception can be identified at any step in the process of sampling, analysis, data reporting, and data review. The person who finds an exception completes a PER/NCR form and transfers the form to the performance exception coordinator (PEC)/TL. The PEC/TL delivers a copy of the form to the appropriate personnel (e.g.,ASC, LC, or PM) for concurrence. If concurrence is not reached, the PER/NCR is closed or the initiator makes whatever revision to the PER/NCR is required. When there is concurrence, a PER/NCR is opened by the PEC. The PER/NCR is entered into the PER/NCR tracking data base. The PEC delivers the PER/NCR to the individual or organization responsible for initiating the exception. The individual or organization reviews the PER/NCR and responds by recording the disposition, probable cause, and actions to prevent recurrence. The PER/NCR is returned to the PEC who distributes the completed form to a disposition team that includes the initiator for review of the response and approval or rejection. If the response is rejected, the reason for rejection of the response is noted. If the response is accepted, the PER/NCR is closed. Otherwise, the PER/NCR is returned for further response by the responsible individual or organization, and the steps previously outlined are repeated until the response is accepted. During processing of each PER/NCR, each exception is reviewed by the appropriate QA personnel for elevation of the exception to an Energy Systems nonconformance. The original closed PER/NCR is placed with the data and submitted to the project file with the data package. In addition, when the PER/NCR is closed, a copy is submitted to the project file.

4.20 OTHER PROJECT DATA

The following discusses specifics of fulfilling additional data requirements.

4.20.1 CRRI Fish Data

Because of a limited field season, fish tissue sampling for the CRRI occurred before this FSD was prepared. The data base described in this document has been designed to accommodate the data types resulting from the fish sampling effort. The field and bioindicator data are recorded on data forms. These data will be double-entered and compared, and any discrepancies resolved. An application program will be used to read the data and write them into the project data base. Analytical laboratory data will be obtained electronically and processed as described in Sect. 4.12. All relevant field and laboratory data will undergo verification and validation.

4.20.2 Well Construction and Development

The life cycle of a characterization well or a piezometer installation is currently defined within the IMS to reflect the following phases:

- initial drilling,
- well construction,
- well monitoring,
- well development,
- well modification, and
- well plugging and abandonment.

Procedures have been established to ensure conformance to standard methods in all life cycle phases. The procedures involve use of several forms to record and disseminate information. These forms constitute an important component of the IMS and are used for data collection and input of the defined life cycle phases.

The initial drilling establishes a bore hole at a targeted monitoring location for the eventual construction of a characterization well or piezometer. The IMS will store initial drilling characteristics about the bore hole using the geological drill record form. This form records such information as well identifier, bore hole start date, bore hole completion date, total depth, depth to bedrock, ORNL grid location, drilling method, and drilling contractor.

Well construction encompasses the construction of well casings and data input screens to enable the collection of groundwater samples and hydrologic data. For this phase, the IMS will store well construction characteristics using the well installation record and well installation/completion forms. These forms record such additional information as casing materials summary data, annular materials, and dedicated equipment data.

Well monitoring involves the field measurement and sampling of groundwater levels and quality. In addition, this phase includes well purging. The discussion of collecting field measurements and samples may be found in other sections of this document. The IMS will store data about the well purging event using the well purging and sampling form. This form records such information as the purge method and final purge volume.

Well development is the process of removing fine-grained materials (e.g. silts and clays) from the filter pack and surrounding formation materials to restore natural hydraulic conditions, to achieve good hydraulic communication between the monitoring well and natural formation, and to enhance well yields. Methods may include over-pumping with a submersible pump, bailing, or surging. For the well development phase, the IMS will maintain information recorded on the well development record form. This form records information such as well development method, well development begin and end dates, initial depth to base of well, and final depth to base of well. The form records similar data as that collected during the well monitoring phase, including field measurements and well purge information. The field measurements taken during the well development phase are necessary to determine whether further development is required.

Well modification includes any physical change to an existing well or piezometer. Modifications to a well may entail surface reconfiguration, downhole recompletion, well workover, or downhole equipment installation. For the well modification phase, the IMS will store data recorded on the Existing Well Modification Record form. This form records information such as modification type, modification start and end dates, surface reconfiguration activity, new surface materials, downhole recompletion activity, new well dimensions, backfill materials, new casing materials, and equipment installation.

Well plugging and abandonment is the process of closing and sealing a well to prevent further well activity. The data maintained by the IMS for this phase is limited to the date the well was plugged and the material used for plugging.

4.21 MAINTAIN REFERENCE TABLES

There are many tables in the data base that contain reference information that changes infrequently, if at all. These tables initially will be loaded and will be modified by appropriate personnel through table maintenance edit screens. Table 7.1 in Sect. 7 defines the reference tables and the roles that have write access privileges.

4.22 HISTORICAL DATA

Several sources of historic data for CRRI and WAG 6 in varying electronic formats will be used to analyze trends on the site. Pertinent historical data to be loaded into the IMS will be required to meet, at a minimum, the data constraints of the OREIS Version 1.2 data structures. Data that cannot meet these constraints will not be loaded into the IMS, unless specifically called for by the project manager.

Appendix E contains a description of how the OREIS Version 2.0 data structures can be mapped to the CRRI/WAG 6 data base. Historic data that meet the Version 1.2 data constraints will be run through the OREIS 2.0 data structure conversion routines before being loaded into the IMS. The CSD will contain the processing rules for loading historical data in OREIS 2.0 formats into the CRRI/WAG 6 IMS.

5. DATA STRUCTURES, REPORT LAYOUTS, AND PROCESSING RULES

The physical data structures supporting the CRRI and WAG 6 projects are shown in Appendix G. Because of time constraints, the report layouts and processing rules have been delayed until the CSD phase. The project will utilize the prototype system including SAS®, and the ORACLE® forms generation capabilities to assist in developing these reports.

6. SYSTEM ADMINISTRATION

System administration includes data base consistency rules controlling access, data base content changes, production data backups and archival, access roles, and table maintenance.

6.1. DATA BASE CONSISTENCY RULES

The IEF® Computer-Aided Software Engineering (CASE) tool has been used to generate the model for this system. The data management rules and data constraints defined in the model are being implemented in the design of the data base.

6.2 ACCESS CONTROL AND ADMINISTRATION

The information to be maintained in the IMS is considered nonsensitive. Administrative and procedural controls will be implemented to provide for information protection and integrity. To provide these controls, access to individual functions, entity types, and files in the IMS will be maintained based on specified user roles. Each role will be assigned specific levels of access for system administration, data entry, and data editing capability.

The proposed access controls for the IMS are described in detail in the items that follow.

1. Authorized users will have on-line access via an interplant network to the system. Access to the IMS will be controlled through an internal access control function administered by the system manager. Additional access control will be maintained at the data base and file level as specified in the User Access Views matrix.

2. One or more system managers will be assigned to the IMS by the CRRI and WAG 6 project managers. System managers will be allowed to access all IMS functions.

3. Energy Systems CRRI and WAG 6 project team members will be added by the system manager based on project roles. Non-project members and Energy Systems users will be approved by the CRRI Program Manager or the WAG 6 Project Manager. Once an access request is approved, the appropriate access will be granted by the system manager. A copy of the access request will be maintained on file by the system manager. The system manager will periodically review the access requests to ensure that they are appropriate.

4. System managers are the only IMS users who can add users to, change users of, and delete users from the Access Control Table.

5. Access to the individual functions of the IMS will be controlled by the IMS on the basis of role, function, entity type, and file name combinations.

6.3 DATA BASE CONTENT CHANGE CONTROL

Documenting changes made to the electronic data base is a critical requirement of the data base management system. The IMS uses a generic approach to satisfying this requirement. The approach uses a transaction file to record all modifications and deletions made to the data base. A record in the transaction file consists of a session identifier that denotes a group of related changes, the type and date of change, the person making the change, and the observation and variable name affected by the change, the value before change, and the value following the change. An associated log file summarizes the reason for the changes contained in the transaction file.

6.4. PRODUCTION DATA BACKUPS AND ARCHIVAL

The IMS will provide for data backup on a daily and weekly basis. Weekly backups will be made and stored off-site. At the end of each calendar year, a yearly backup file will be created and saved for historical use.

6.5 ROLE DESCRIPTIONS

The following narrative describes the various roles that interact with the project data base. These roles are not mutually exclusive (e.g., a person may have more than one designated role at a time).

Field sampling team leader. The FSTL assists in the implementation of the sampling defined in the SAP. This person coordinates and prepares for field sampling activities, assigns sampling team members to teams, and oversees all field data collection, recording, and documentation activities. The CRRI FSTL has limited write access via a software application to the data base.

Preparation laboratory supervisor. The CRRI preparation laboratory supervisor coordinates and supervises the preparation of field sampling kits as specified by the FCTM and the processing of field samples as defined by the LPTM. This person has limited write access via a software application to the data base.

Analytical services coordinator/laboratory coordinator. The ASC/LC coordinates the development of applicable SOWs to procure subcontract technical services to support the project and verifies that methods specified are appropriate for meeting project/program DQOs. The ASC/LC serves as a receiving and review point for all laboratory data, ensures that laboratory supplemental QC data are placed in program files, and ensures that the laboratory data are properly validated and verified in accordance with the project requirements. The ASC/LC is responsible for assembling and organizing the validation personnel. The ASC/LC acts as the coordinator of the data validation program and any deviations or modifications to the program must be approved by him/her. This person has limited write access to the data base.

Field data loader. The CRRI field data loader coordinates the incorporation of field data into the project data base. Specific activities include processing electronically submitted field data, supervising computerization of raw data, and identifying, documenting, and whenever

possible, resolving problems in the data submissions. This person has limited write access via a software application to the data base.

Preparation laboratory data loader. The CRRI preparation laboratory data loader coordinates the incorporation of data from the preparation laboratory into the project data base. Specific activities include processing electronically submitted data, supervising computerization of raw data, and identifying, documenting, and whenever possible resolving problems in the data submissions. This person has limited write access via a software application to the data base.

Analytical laboratory data loader. The CRRI analytical laboratory data loader coordinates the incorporation of analytical data into the project data base. Specific activities include processing electronically submitted data, supervising computerization of raw data, and identifying, documenting, and whenever possible resolving problems in the data submissions. This person has limited write access via a software application to the data base.

Data verifier/validator (DVV). The DVV is responsible for performing the verification and validation on the field and laboratory data. The DVV is responsible for assigning qualifiers to the data as part of the verification or validation process. The DVV also evaluates QC information relative to technical and analytical viability. This person has limited write access via a software application to the data base.

General applications user. This category covers the majority of the users of the project data base. Examples of users in this category include data analysts, risk assessors, task leaders, and program managers. These people have read-only access to the data base.

System application manager. The system application manager is the primary administrator for the system and is responsible for maintaining the system integrity, performing system backup, and approval of user access. This person has comprehensive write access to the data base.

Data entry clerk. The WAG 6 DEC incorporates all field data from the monitoring devices, bar code equipment, and field documentation to the data base. The DEC prints all sample labels, necessary bar code labels, FASs, and COC forms. This person has limited write access via a software application to the data base.

Data manager. The WAG 6 DM responsible for verifying all information uploaded to the data base by the DEC. The DM also makes all changes needed to items under configuration control. The DM has write access via a software application.

Sample task leader (STL). The WAG 6 STL performs and documents all field activities, installs and maintains all dedicated equipment, and oversees sample collection, monitoring and data acquisition activities. There will be an STL for each sampling/monitoring project. The meteorological, groundwater level, and surface water STLs have limited write access via a software application to the data base. The groundwater quality and seeps and springs STLs do not have access to the WAG 6 data base.

Field technician. The WAG 6 FT maintains and calibrates all portable equipment, inventory supplies, prepare sample kits, ship samples, oversee waste management, and document field activities. The FT does not have access to the WAG 6 data base.

Field task leader. The Field Task Leader will ensure and document that all field and laboratory personnel are properly informed and trained. The FTM will manage and/or perform inspections and calibrations, and maintain accurate documentation of all site equipment calibration and servicing activities. This person manages and/or performs field monitoring and sampling activities and ensures that all such activities are performed and documented in accordance with QA protocols and approved procedures. For WAG 6, this person does not have access to the data base. CRRI access is via the FSTL role.

Table 7.1 defines the access available to each role for each entity in the project data base. The numbered columns in Table 7.1 refer to the numbers associated with each role previously described. Roles that do not have access to the data base (FT and Field Task Leader) are not defined in the table because the entire column would be blank.

6.6 LOOK-UP TABLES MAINTENANCE GUIDELINES

Look-up tables are identified in Table 6.1 as row occurrence entries of type "R." Look-up table maintenance is to be a responsibility of the System Application Manager. Whenever IMS users discover additional entries or modifications to look-up tables, the user will submit the additions/changes to the System Application Manager. The System Application Manager will then apply the suggested table modifications, if appropriate.

Table 6.1 Role Access Rules

Entity		Roles											
Name	Type[1]	1	2	3	4	5	6	7	8	9	10	11	12
ACTION_LIMIT	D	R	R	R				R	R	W		R	
AREA_GROUP	R	R	R	R				R	R	W		R	
AREA_GRP_LOCATIO	D	R	R	R	R			R	R	W	R	R	
BADGE_PERSON													
BORE_HOLE	D	W			W			W	R	W	W	W	
COMP_MATERIAL													
COMPONENT_TYPE													
COMP_TYP_MATERIA													
DATA_FORM	D	W	W	W	W	W	W	R	R	R	W	W	
DATA_USE_QUALIFI	R	R	R	R				R	R	W		R	
DRILLING_EVENT													
DRILLING_METHOD													
ENV_PROJECT	R	R	R	R				R	R	W		R	
ENV_MON_LOC_FLO	D	R	R	R				R	R	W		R	

Table 6.1 (continued)

Entity		Roles											
Name	Type[1]	1	2	3	4	5	6	7	8	9	10	11	12
ENV_PROJECT_TASK	R	R	R	R				R	R	W		R	
ENV_PROJ_TASK_LO	D	R	R	R	R			R	R	W	R	R	
EQUP_CALB_EVENT	D	R	R	R	W			R	R	R	W	R	
EQUP_CALB_EVT_FR	D	R	R	R	W			R	R	R	W	R	
EQUP_CALB_RESULT	D	R	R	R	W			R	R	R	W	R	
EQUP_INSPEC_EVEN													
EQUP_INSP_EVT_FR													
EQUP_LOC_INIT_EVT													
EQUP_REPAIR_EVEN													
EXCEPTION_EVENT	D	W	W	W	W	W	W	W	R	R	W	W	
EXTERNAL_QC_SAM	D	R	R	R	W			R	R	R	W	R	
FIELD_COC													
FIELD_COC_TEAM_M													
FIELD_EQUIPMENT	D	R	R	R	W			R	R	R	W	R	
FIELD_MEASUREME	D	R	R	R	W			R	R	R	W	R	R
GEOLOGIC_FORMAT	D	W			W			W	R	W	W	W	
GEOLOGIC_GROUP													
GPS_LOCATION													
HOLE_INTERVAL													
HOLE_INTERVAL_CH													
INT_QC_SAMPLE	D	R	R	W				R	R	R		R	
INTERNAL_CHAR_TY													
KIT	D	R	W	R				R	R	R		W	
LAB	R	R	R	W				R	R	R		R	
LAB_CONTACT	R	R	R	W				R	R	R		R	
LAB_INSTRUMENT	R	R	R	W				R	R	R		R	
LAB_INST_CALB_EVT	D	R	R	R		W	W	R	R	R		R	

Table 6.1 (continued)

Entity		Roles											
Name	Type[1]	1	2	3	4	5	6	7	8	9	10	11	12
LAB_INST_CALB_RSL	D	R	R	R		W	W	R	R	R		R	
LAB_TEST	L	R	R	W				R	R	R		R	
LAB_TEST_MATRIX	R	R	R	W				R	R	R		R	
LAB_TEST_PARAMET												R	
LAB_TEST_PARAM_LI	R	R	R	W				R	R	R		R	
LAB_TEST_QUAL	R	R	R	W				R	R	R		R	
MATRIX_TYPE	R	R	R	R				R	R	W		R	
MEASUREMENT_UNI	R	R	R	R				R	R	W		R	
MEAS_UNIT_CONV_F	R	R	R	R				R	R	W		R	
MONITORING_EVEN	D	W	R	R				R	R	R		W	
MONIT_EVT_DATA_F	D	W	R	R				R	R	R		W	
MONIT_FREQUENCY	R	R	R	R				R	R	W		R	
MONIT_LOCATION	D	R	R	R	W			R	R	R	W	R	
MONIT_LOC_ALIAS	R	R	R	R				R	R	W		R	
MONIT_LOC_SRVC	D	W	R	R				R	R	R		W	
ME_SMPL_TEAM_MB	D	W	R	R				R	R	R		W	
PARAMETER	R	R	R	R				R	R	W		R	
PARAM_ANALYSIS_C	R	R	R	R				R	R	W		R	
PARAM_ANALYSIS_G	R	R	R	R				R	R	W		R	
PLUG_MATERIAL	R	R	R	R				R	R	W		R	
PLUGGING_EVENT													
PLUGGING_METHOD													
PLUG_INTV_MATERI													
PRESERVATIVE	R	R	R	R				R	R	W		R	
PT_ANLY_CAT_MATR	R	R	R	R				R	R	W		R	
PURGE_EVENT	D	W			W			W	R	W	W	W	
PURGE_METHOD	R	R	R	R				R	R	W		R	

Table 6.1 (continued)

Entity		Roles											
Name	Type[1]	1	2	3	4	5	6	7	8	9	10	11	12
QC_ANALYTE	R	R	R	R				R	R	W		R	
QC_MATERIAL	R	R	R	R				R	R	W		R	
QC_RESULT	D	R	R	R		W	W	R	R	R		R	
QC_SAMPLE_REF_MA	D	R	R	R		W	W	R	R	R		R	
QC_TYPE	R	R	R	W				R	R	R		R	
QC_TYPE_COMPONE	R	R	R	W				R	R	R		R	
REFERENCE_MATER	R	R	R	W				R	R	R		R	
REF_MATL_ANALYT	R	R	R	W				R	R	R		R	
REGULATORY_MET	R	R	R	W				R	R	R		R	
RIVER	R	R	R	R				R	R	W		R	
SAMPLE	D	W	W	R				R	R	R		W	
SAMPLER_TYPE	R	R	R	R				R	R	W		R	
SMPL_DELIVERY_GR	D	R	R	W				R	R	R		R	
SAMPLE_PAIR_TYPE													
SAMPLE_LAB	D	R	R	R		W	W	R	R	R		R	
SAMPLE_RESULT	D	R	R	R		W	W	R	R	R		R	
SMPL_RSLT_QUAL	D	R	R	R		W	W	R	R	R		R	
SAMPLE_TEST	D	R	R	R		W	W	R	R	R		R	
SAMPLE_TYPE	R	R	R	R				R	R	W		R	
SAMPLE_WASTE_CO	R	R	R	R				R	R	W		R	
SMPL_ANLY_PLAN	R	R	R	R				R	R	W		R	
SMPL_CONT_TYPE	R	R	R	R				R	R	W		R	
SAMPLING_PROCED	R	R	R	R				R	R	W		R	
SMPL_REQUIREMEN	R	R	R	R				R	R	W		R	
SAP_ELEMENT	R	R	R	R				R	R	W		R	
S_SHIP_CONTNR	D	R	R	W				R	R	R		R	
SMPL_ASSOC_FORM	D	W	W	R				R	R	R		W	

Table 6.1 (continued)

Entity		Roles											
Name	Type[1]	1	2	3	4	5	6	7	8	9	10	11	12
SMPL_ASSOC_INT_QC	D	R	R	W				R	R	R		R	
STATEMENT_OF_WO	R	R	R	R				R	R	W		R	
TEST_PARAM_QC_LI													
USGS_WEIR_FLOW	D	W			W			W	R	W	W	W	
VALID_RSLT_QUAL	D	R	R	R				R	W	R		R	
WASTE_CODE	R	R	R	R				R	R	W		R	
WELL	D	W			W			W	R	W	W	W	
WELL_COMPONENT													
WELL_DEVELOPMEN	D	W			W			W	R	W	W	W	
WELL_INSTALL_EVE													
WELL_MOD_EVENT													

[1]D: Data table R: Reference (look-up) table

7. SYSTEM INTERFACES

The IMS will be required to exchange data with other systems, including an interface to OREIS. The WAG 6 project has a requirement to supply and receive data from the Office of Environmental Compliance and Documentation in support of groundwater quality monitoring. Electronic files containing data from other systems will be generated in the appropriate format for loading into the data base. This system will use available SAS® and ORACLE® export tools to provide project data to other systems in acceptable formats.

Validated sample data will be transferred to OREIS on a regular basis. Appendix F contains a description of how the CRRI/WAG 6 data structures can be mapped to the OREIS Version 2.0 data structures. The CSD will contain the processing rules for extracting data from the CRRI/WAG 6 IMS.

8. TEST PLAN ENVIRONMENT

The system test plan consists of the following:

- **Module testing.** To assure that the proper functions are being executed correctly. When a function is executed, it must perform the action it was designed to perform.

- **Data integrity.** To confirm the correct data are saved to and retrieved from the data base. The correct records must be accessed in a query, and the data must be correctly transferred between the data base and the user interface program.

- **Interface validation.** The user interface program must execute the correct function for each defined keypad function key. The interface must execute a different series of screens based on user input.

- **Data access validation.** To ensure the internal security features of the system operate effectively and only the appropriate users are able to view and/or update their data.

- **Report validation.** To verify reports contain the data that should have been selected and that the summation fields have been properly calculated. Also to verify report layouts are acceptable.

- **Data upload validation.** To confirm data uploaded to the IMS data base have been transferred in the correct form, and any errors or warnings have been correctly generated and/or resolved.

The test data will consist of data created specifically for testing purposes.

9. FUNCTIONAL REQUIREMENTS RECONCILIATION

9.1 SYSTEM OBJECTIVES

Requirements	Meets/exceeds requirement	Comments
To support the project data life cycle. This project encompasses all project data management activity including field sampling preparation, field measurement collection, sample tracking, laboratory analyses of environmental samples, data verification, validation and assessment, data consolidation and storage, data analysis, spatial analysis and mapping, summarization and data reduction, and data transfer to OREIS	Yes	User participation from data collection, input, and analysis was obtained for the DMP/FSD
To support simulations and risk assessment calculations, data presentation, data product documentation, and data document archival	Yes	
To support the entire sample collection process, the system will ensure accountability and traceability by generating and maintaining unique sample identifiers, tracking sample data, incorporating field measurements, and logging sampling team information	Yes	Data contained in Sample, Field Measurement, Monitoring Event, Sampling Event, Sampling Team Member, and other related entities
To support the collection of sample data from various media and data sources including surface water, biota, groundwater, seeps and springs, sediment, field logbooks, sampling plans, laboratory results, QA results, and meteorological measurements	Yes	Data contained in Sample, Monitoring Location, Matrix Type, and Field Measurement entities
To support the timely production of status reports to be provided to the project manager on a monthly or other periodic basis, as determined in the QAPjP	Yes	Data available through summary reports and ad hoc queries
To provide for retrieval of all pertinent information regarding the status of specific monitoring/sampling events and the current status of individual samples	Yes	Data contained in Sample, Monitoring Event, and Sample entities

Requirements	Meets/exceeds requirement	Comments
To support ad hoc requests for data to meet specific information requirements of project staff	Yes	Data available through summary reports and ad hoc queries
To support the coordination and tracking of laboratory analysis results	Yes	Data contained in parameter, Sample Result, QC Result, and Surrogate Result entities
To facilitate the electronic submission of sample results from analytical laboratories	Yes	Analytical results data to be captured electronically via contract compliance screening and CAVEAT® software products
To provide support for near real-time data validation of field and/or laboratory data	Yes	Field data to be validated through IMS software applications and the use of bar code and wee reader input devices. Analytical Laboratory results to be validated by the CAVEAT® software product
To provide organization, integrity, security, traceability, and consistency for electronic data	Yes	
To provide organization, integrity, security, traceability, and consistency for electronic data	Yes	Accomplished through use of CASE tool to generate model and database
To provide structures and procedures that minimize the introduction of error resulting from unsatisfactory data	Yes	Accomplished through the use of IMS generated forms, the use of bar code and wee reader data input devices where possible, and data verification procedures
To facilitate transfer of project data to the ORNL ER site data base	Yes	The IMS will use available SAS® and ORACLE® export tools to provide project data to the ER site database
To ensure timely and accurate transfer of validated data to the OREIS data base	Yes	The IMS will use available SAS® and ORACLE® data export tools to provide project data to the OREIS system in acceptable formats

Requirements	Meets/exceeds requirement	Comments
To implement data change control through role definitions and access views	Yes	The IMS will provide data change control through use of data access views and role definitions. See Access Control and Administration & Role Description sections for details
To use the Texas Instruments, Inc. IEF® tool to model business rules and data for the project	Yes	The Texas Instruments, Inc IEF® tool was used extensively during the modeling phase of the project
To model business rules and data for the project using the Texas Instruments, Inc. IEF® tool	Yes	Configuration control practices and guidelines will be observed to ensure the reliability and integrity of IMS software applications
To ensure software applications (e.g., SAS®, ORACLE® reports) will be under configuration control		
To support computerized records management	Yes	Data contained in the Data Forms and associated entities

9.2 INPUT REQUIREMENTS

Requirements	Meets/exceeds requirements	Comments
Bar coding technology will be used to facilitate the transfer of field and laboratory information into project data bases	Yes	Bar code readers will be used during field sampling
Selected field and laboratory QC data will be maintained in the IMS	Yes	Data contained in External QC Sample, INT QC Sample, QC Result, and associated entities
Information from SAPs will be entered into field collection reference tables. The reference tables will then be used to begin populating the field and laboratory processing task maps	Yes	Field collection Reference tables will be used to track tasks from SAPs
Information from COC forms will be stored in the IMS to facilitate the tracking of samples	Yes	Data contained in Sample, Parameter, Field Measurement, Monitoring Event, and other associated entities
Data files will be uploaded to a temporary area in the IMS and will be transferred from that area to the appropriate data base tables. Any errors in loading will be flagged. Data entered will be verified by comparing the electronic results with the hard-copy data package	Yes	Field data and analytical result data will be verified and validated before storage within the IMS. See Verification and Validation sections for further details
Data will come in from external labs as specified in the laboratory SOW. The "Interagency Format" for the CLP methods will be used. The SOW will specify a consistent electronic data format for non-CLP methods	Yes	Analytical Laboratory result data will enter the IMS in electronic format. The ASC\LC and DC roles will facilitate the transfer of data between the laboratory and the IMS. See Receipt of Data Deliverables from Laboratories section for details
Any changes made to items under configuration control will be tracked in a file	Yes	Changes to IMS project data will be tracked within the IMS

9.3 OUTPUT REQUIREMENTS

Requirements	Meets/exceeds requirements	Comments
The IMS will generate COC forms and labels for sample containers based on the information entered from the field and laboratory processing task maps	Yes	
The IMS data base will be used to support the generation of tabular, graphical, and statistical presentations of data collected during monitoring events. The organization of the data will support the ability to describe the organization of the field events, for example, by study area, sample type or grouping, location within study area, and sample depth or sequence number	Yes	The functions will be accomplished using the SAS®/ACCESS interface to the ORACLE® relational data base management system (RDBMS)
All requests for access to project information require the approval of the project manager	Yes	Users will be approved by the CRRI or the WAG 6 Program Manager

9.4 PERFORMANCE REQUIREMENTS

Requirements	Meets/exceeds requirement	Comments
The IMS for WAG 6 and CRRI will reside on Sun (SPARCstation 10) workstations. Data will be stored using the ORACLE® data base management system. SAS® a data analysis (query, statistics and graphics) software tool and ARC/INFO® (a geographical information system) will also be available. This computer platform and set of software tools is directly compatible with OREIS	Yes	
The WAG 6 system will be used as a computer and software backup in the event of a CRRI computer system outage of more than 1 week. Conversely, the CRRI system will be used as a computer and software backup in the event of a WAG 6 computer system outage of more than 1 week. The CRRI and WAG 6 systems will have identical physical data base structures, similar hardware configuration, and many of the same information management procedures that will enhance their backup capabilities	Yes	Details will be provided in the WAG 6/CRRI Quality Assurance Assessment Plan (QAAP). Refer to Maintain Hardware and Software section
Computer system access will be controlled by user name and password	Yes	Computer system access will be controlled via system administration procedures, as well as menu and access control mechanisms
Access to project data will be protected by creating data views based on user needs and roles	Yes	See above comment
Data will be backed up daily. Weekly backups will be made and stored off-site. At the end of each calendar year, a yearly backup file will be created and saved for historical use	Yes	Details will be provided in the WAG 6/CRRI QAAP. Refer to Maintain Hardware and Software section

Requirements	Meets/exceeds requirement	Comments
Software application version numbers will be maintained	Yes	Configuration control software RCS will provide the means of maintaining IMS software application version numbers
Any sample identifiers for which samples were not collected will be retained in the data base	Yes	Surplus sample containers may be relabeled and reused but the sample identifiers will not be reused
An e-mail account will be established on the workstation to solicit users' input regarding performance, capability needs, etc.	Yes	This account will be used to solicit user comments and input for consideration to future IMS enhancements and modifications
The FSTL will be able to query the IMS on demand to generate a list of samples where delivery of the analytical results exceeded the specified time frame	Yes	This function will be provided via user-defined menu driven queries
Each data laboratory package will be numbered, and the numbers will be assigned to the existing records in the IMS for those samples reported in the data package	Yes	Data contained in relationships between Sample, Sample Lab and S entities
Climatic conditions and groundwater levels will be monitored at WAG 6. Data generated from these monitoring events will be entered and stored in the IMS as field measurements	Yes	Data contained in Field Measurements entity

9.5 COMPUTER SECURITY AND ACCESS CONTROL

Requirements	Meets/exceeds requirement	Comments
Computer system access will be controlled by C&TS provided user name and password	Yes	Computer system access will be controlled via system administration procedures as well as menu and access control mechanisms
Access to project data will be protected by creating data views based upon user needs and roles	Yes	See above comment
Data will be backed up on a daily basis. Weekly backups will be made and stored off-site. At the end of each calendar year, a yearly backup file will be created and saved for historical use	Yes	Details will be provided in the WAG 6/CRRI OAAP. Refer to Maintain Hardware and software section
Software application version numbers will be maintained	Yes	Configuration control Software RCS will provide the means of maintaining IMS software application version numbers

9.6 GENERAL SYSTEM REQUIREMENTS

Requirements	Meets/exceeds requirement	Comments
Any sample identifiers for which samples were not collected will be retained in the data base	Yes	Surplus sample containers may be relabeled and reused but the sample identifiers will not be reused
To reduce data errors, efforts will be made to minimize the number of data transfers needed to support the IMS by running the majority of the applications needed to support the project on the workstation	Yes	
A project E-mail account will be established on the workstation to solicit users' input regarding performance, capability needs, etc.	Yes	This account will be used to solicit user comments and input for consideration to future IMS enhancements and modifications
The FSTL, ASC, LC will be able to query the IMS on demand to generate a list of samples where delivery of the analytical results exceeded the specified time frame	Yes	This function will be provided via user-defined menu driven queries
Each data laboratory package will be numbered, and will be tied back to its original sample	Yes	Data contained in relationships between Sample, Sample Lab and S entities
Climatic conditions and groundwater levels will be monitored at WAG 6. Data generated from these monitoring events will be entered and stored in the IMS as field measurements	Yes	Data contained in Field Measurements entity

10. QUALITY ASSURANCE ASSESSMENT PLAN

The QAAP represents the assessment of critical tasks for the CRRI and WAG 6 projects. Problems that could have an impact on the project are identified and assessed in terms of consequence, probability, and risk. Consequence qualifies the seriousness of the problem, probability qualifies the likelihood of the problem, and risk is a combination of the consequence and probability. The rules for determining the required documentation are presented in Table 10.1.

Table 10.1. Rules for Determining Required Documentation for Combinations of Consequence, Probability of Occurrence, and Risk Level

Consequence	Probability	Risk	Required documentation
Insignificant	Low	Acceptable	Rationale
Insignificant	Medium	Acceptable	Rationale
Insignificant	High	Acceptable	Rationale
Significant	Low	Acceptable	Preventative Action
Significant	Medium	Unacceptable	Preventative Action
Significant	High	Unacceptable	Preventative Action

The remainder of this section presents preventative actions for problems with unacceptable risks. The rationale for no preventative action is stated for problems with acceptable risks.

10.1 REQUIREMENTS AND FUNCTIONAL SYSTEM DESIGN DEFINITION

10.1.1 Identify User Requirements

Problem: Incomplete user community
Effect: IMS does not meet user needs
Consequence: Significant

Cause: Insufficient communication within the project
Prob: Low
Risk: Acceptable
Rationale: The CRRI and WAG 6 teams have weekly project meetings

Cause: Insufficient communication between projects
Prob: Low
Risk: Acceptable

Problem: Incomplete user requirements
Effect: IMS does not meet user needs
Consequence: Significant

Cause: Potential users not available to define requirements
Prob: Medium
Risk: Unacceptable
PA: Requirements and functional definition meetings will be held in July and August to define the system requirements. Users will be available to participate in requirements and functional definition meetings.
Resps: Teri Ball, Craig Brandt, Beth Nickle, and Denise Schmoyer
Sch: July–August 18, 1993
Completed: —
Action: —

Problem: Data quality level not defined
Effect: Requirements do not satisfy the data quality needs.
Consequence: Significant

Cause: Insufficient input from users
Prob: Low
Risk: Acceptable
Rationale: Project QA plans specify data quality criteria

10.1.2 Complete Requirements Definition

Problem: Requirements are not complete.
Effect: IMS does not meet user needs.
Consequence: Significant

Cause: Undocumented requirements
Prob: Medium
Risk: Unacceptable
PA: This will be resolved through the review and sign-off of the Requirements and FSD document.
Resps: Craig Brandt, Teri Ball, Beth Nickle, and Denise Schmoyer
Sch: Requirements/FSD document draft due August 20, 1993
Completed: —
Action: —

Problem: Requirements do not support both current and future needs.
Effect: IMS cannot support future growth.
Consequence: Significant

Cause: Incomplete process and entity models
Prob: Medium
Risk: Unacceptable
PA: To acquire data needs we may not have anticipated, other project models with similar data needs are being reviewed and incorporated into the IMS model.

Resps: Teri Ball, Beth Nickle, Cindy Serbin
Sch: July–August 18, 1993
Completed: August 13, 1993
Action: The K-25 Groundwater and Energy Systems Laboratory IMS models were reviewed and relevant information was incorporated into the IMS model.

10.1.3 Complete Functional System Definition

Problem: FSD is not completed on time.
Effect: Applications development will be delayed.
Consequence: Significant

Cause: Insufficient allocation of resources.
Prob: Medium
Risk: Unacceptable
PA: A Memorandum of Understanding (MOU) allocating sufficient resources for the projects will be developed.
Resps: Craig Brandt and Teri Ball
Sch: MOU due on July 30, 1993
Completed: July 26, 1993
Action: MOU approved by the project managers

Problem: Essential elements are not included in the FSD.
Effect: IMS will not support user's needs.
Consequence: Significant

Cause: Unclear and/or undefined business rules and data definitions
Prob: Medium
Risk: Unacceptable
PA: The draft of the FSD components will be issued to the project for review. During compilation of the draft, the technical working group maintained a working document of unresolved issues and proposed business rules.
Resps: Teri Ball, Beth Nickle, Craig Brandt, and Denise Schmoyer
Sch: July–August 18, 1993
Completed: —
Action: —

10.2 COMPUTER SYSTEM DESIGN

10.2.1 Complete Data Base Model

Problem: Data model does not translate from logical to physical data structure.
Effect: Delay in implementing physical data base structure
Consequence: Significant

Cause: Incompatibility between data modeling tools
Prob: Medium
Risk: Unacceptable
PA: A trial conversion from the logical IEF® model to the physical ORACLE® data base will be performed to identify problems. Corrective measures will be taken to prevent revealed problems from reoccurring.
Resps: Teri Ball and Beth Nickle
Sch: Trial conversion due on July 30, 1993
Completed: July 30, 1993
Action: Data attribute name and lengths were redefined as needed.

Problem: Data from various tasks cannot be combined to create a series of linked files for analysis.
Effect: IMS will not meet user's needs.
Consequence: Significant

Cause: Incomplete relationships between data entities within the data model.
Prob: Low
Risk: Acceptable
Rationale: The Texas Instrument IEF® tool was used to develop the data model. The IEF® tool will flag data relationship inconsistencies.

Cause: Data base lacks integrity and consistency.
Prob: Low
Risk: Acceptable
Rationale: The IEF® tool used to develop the data model will ensure data integrity and consistency.

Problem: Data base attributes do not have standardized definitions and formats.
Effect: Data base is incompatible with other projects.
Consequence: Significant

Cause: Data standards were not enforced.
Prob: Low
Risk: Acceptable
Rationale: The Y-12 C&TS Information Engineering Standards and OREIS definitions were used.

10.2.2 Identify Hardware and Software

Problem: Hardware is not available to support the project's needs.
Effect: Delay of implementation of the IMS.
Consequence: Significant

Cause: Hardware was not selected and ordered on time.
Prob: Medium
Risk: Unacceptable
PA: Arrangements will be made to use an alternate workstation until necessary hardware is acquired.
Resps: Teri Ball and Craig Brandt

Sch: Arrange for interim workstation by July 30, 1993.
Completed: July 1, 1993
Action: OREIS site workstation will be available for use until projects' hardware are available.

Cause: Temporary power outages
Prob: Low
Risk: Acceptable
Rationale: A backup power source will be acquired to allow an orderly shutdown of the IMS.

Cause: Hardware failure
Prob: Medium
Risk: Unacceptable
PA: Arrangements will be made to use an alternate workstation until hardware is repaired.
Resps: Teri Ball and Craig Brandt
Sch: Arrange for interim workstation by July 30, 1993.
Completed: July 1, 1993
Action: The CRRI and WAG 6 workstations will provide backups for each other, and the OREIS site workstation will be available for use until project hardware is repaired.

Problem: RDBMS software not available to support the project's needs
Effect: Delay of implementation of the IMS
Consequence: Significant

Cause: Energy Systems contract for the RDBMS was not awarded.
Prob: Low
Risk: Acceptable
Rationale: The contract was awarded.

Cause: Future releases of RDBMS software may cause applications failure(s).
Prob: Low
Risk: Medium
PA: Before the implementation of new release software, the applications will be tested.
Resps: Teri Ball and Beth Nickle
Sch: (as necessary)
Completed: —
Action: —

10.2.3 Identify Applications

Problem: Application needs are not defined.
Effect: IMS programs do not support the daily project business.
Consequence: Significant

Cause: Project activities are not defined.
Prob: Low

Risk: Acceptable
Rationale: A project process analysis was completed during the data modelling phase of the IMS development. Meetings were held with users to identify their activities and the flow of information between activities and data users.

Cause: Tasks that should be automated are not identified.
Prob: Low
Risk: Acceptable
Rationale: Meetings have been held with users to discuss the capabilities of the IMS. Most users have experience with computer applications and have identified application needs.

Problem: Reporting needs are not defined.
Effect: Development of additional applications will be required.
Consequence: Insignificant

Cause: Data analyses results identify new reporting needs.
Prob: High
Risk: Acceptable
Rationale: The data management teams have application programmers to support development of additional applications.

10.2.4 Identify Security Needs

Problem: Access to the data is not properly controlled.
Effect: Unauthorized changes can be made to the data, destroying data integrity. Project members cannot use the data they need for their tasks.
Consequence: Significant

Cause: Access requirements for users are not defined.
Prob: Low
Risk: Unacceptable
Rationale: The FSD defines project roles and identifies the access level required by each role.

Cause: Controls are not implemented to enforce approved access levels.
Prob: Low
Risk: Unacceptable
Rationale: The ORACLE® software has the capabilities to assign data access levels by user/tables. This feature will be implemented.

Problem: Unauthorized changes are made to application programs.
Effect: Applications may fail and corrupt the data base or produce invalid results.
Consequence: Significant

Cause: Access to the application code is not controlled.
Prob: Low
Risk: Unacceptable
Rationale: Access to the ORACLE® application code will be controlled using ORACLE® security and the roles defined by FSD. Access to the SAS® application code will be controlled by UNIX® operation system security.

10.2.5 Complete CSD Documentation

Problem: CSD documentation is not completed on time.
Effect: IMS implementation will be delayed.
Consequence: Significant

Cause: Insufficient allocation of resources.
Prob: Medium
Risk: Unacceptable
PA: An MOU identifying sufficient resources for the projects will be developed.
Resps: Craig Brandt and Teri Ball
Sch: MOU due on July 30, 1993
Completed: July 26, 1993
Action: MOU approved by the project managers

Problem: Essential elements are not included in the CSD.
Effect: IMS will not support the user's needs.
Consequence: Significant

Cause: Lack of communications with users.
Prob: Medium
Risk Unacceptable
PA: A draft of the CSD will be issued to the project teams for review and approval.
Resps: Craig Brandt, Denise Schmoyer, Teri Ball, and Beth Nickle
Sch: July–August, 1993
Completed: —
Action: —

10.3 APPLICATIONS DEVELOPMENT

Problem: CRRI and WAG 6 code is not adequate.
Effect: Delay of implementation of the IMS.
Consequence: Significant

Cause: Code may not accurately reflect and enforce the agreed upon business rules.
Prob: Low
Risk: Unacceptable

PA: Additional technical personnel resources will be allocated to focus on QA of the code and to support business rule vs code assessment and unit/integration/regression testing.
Resps: Teri Ball and Beth Nickle
Sch: (as required)
Completed: (as required)
Action: Identify specific technical personnel for PA tasks. Develop written testing plans. Conduct squad reviews to compare business rules and the application's code.

Cause: Business rules may have changed from the FSD because of changes in regulations and/or company policy and/or modifications to established business rules.
Prob: Medium
Risk: Unacceptable
PA: Designated responsible personnel will monitor and identify any upcoming potential business rule changes and identify impacts to the CRRI/WAG 6 project. If necessary, the appropriate software application modification(s) will be prioritized and scheduled to ensure that the software code is adequate
Resps: Teri Ball and Beth Nickle
Sch: (as required)
Completed: (as required)
Action: —

Cause: Incorrect and/or insufficient applications definition from user(s)
Prob: Low
Risk: Unacceptable
PA: Ensure that applications are well defined and prioritized in the CSD.
Resps: Teri Ball and Beth Nickle
Sch: (as required)
Completed: (as required)
Action: Designated responsible personnel will ensure sufficient applications definition from users.

Problem: CRRI and WAG 6 software will not interface with other OREIS projects.
Effect: IMS is restricted with respect to usability and transferability
Consequence: Significant

Cause: IMS software is not developed using the standard OREIS toolset.
Prob: Low
Risk: Acceptable
Rationale: The IMS is to be developed using current OREIS software toolset(s).

10.4 IMPLEMENTATION

10.4.1 Create Physical Data Base

Problem: Data base not created on time
Effect: Project deadlines may be missed.
Consequence: Significant

Cause: Insufficient allocation of resources.
Prob: Medium
Risk: Unacceptable
PA: An MOU identifying sufficient resources for the projects will be developed.
Resps: Craig Brandt and Teri Ball
Sch: MOU due on July 30, 1993
Completed: July 26, 1993
Action: MOU is approved by the project managers.

Problem: Data base does not function as planned.
Effect: Project schedules will be delayed.
Consequence: Significant

Cause: Inadequate testing.
Prob: Low
Risk: Acceptable
Rationale: Data base will be tested before it is populated with project data.

10.4.2 Implement Applications

Problem: Users are not satisfied with application performance.
Effect: Applications must be revised.
Consequence: Significant

Cause: Inadequate user testing.
Prob: Medium
Risk: Unacceptable
PA: The application will be tested by the user before it is implemented in a production mode. This testing is in addition to the testing performed by the data management team.
Resps: Craig Brandt, Denise Schmoyer, Teri Ball, and Beth Nickle
Sch: Ongoing
Completed: —
Action: —

Cause: Insufficient training
Prob: Medium
Risk: Unacceptable
PA: Demonstration and training sessions will be held with the users before applications are implemented. ORACLE® training will be made available to users needing access to ORACLE® products such as Data Browser.

Resps: Craig Brandt, Denise Schmoyer, Teri Ball, and Beth Nickle
Sch: Ongoing
Completed: —
Action: —

Problem: IMS performs poorly and is not reliable.
Effect: Slow data base response time
Consequence: Significant

Cause: Inefficient software applications code and insufficient data base tuning
Prob: Low
Risk: Acceptable
Rationale: A technical representative from ORACLE® Corporation will be on-site and available to provide assistance in areas of efficient applications coding and data base tuning during the project's development and implementation phases.

10.5 INFORMATION MANAGEMENT SYSTEM MAINTENANCE

10.5.1 Maintain Data Model

Problem: Changes to the data base structure compromise its integrity and consistency.
Effect: IMS cannot meet users needs.
Consequence: Significant

Cause: Requirements for data links and business rules are violated.
Prob: Low
Risk: Acceptable
Rationale: Changes to the data base structure will be tested using the IEF® tool before they are implemented.

Problem: Changes to the data base structure cause an application to fail.
Effect: Application is unavailable for use, and resources must be spent to modify the application program.
Consequence: Significant

Cause: Application developers are unaware of structure changes.
Prob: Medium
Risk: Unacceptable
PA: Data management teams will be notified of proposed data structure changes and, when necessary, meetings will be held to discuss the changes before they are implemented.
Resps: Craig Brandt, Denise Schmoyer, Teri Ball, and Beth Nickle
Sch: Ongoing
Completed: —
Action: —

Cause: Application developers did not realize the impact of the structure change.
Prob: Low
Risk: Acceptable
Rationale: Major changes in data structure will be implemented in a test mode to allow application testing.

Problem: IMS documentation does not describe the current system.
Effect: Users and programmers do not have the information necessary to use the system.
Consequence: Significant

Cause: Model and attribute changes are not documented.
Prob: Low
Risk: Acceptable
Rationale: The data model will be maintained with the IEF® tool that automatically updates the model documentation.

10.5.2 Maintain Data Contents

Problem: Data are not accurate/timely.
Effect: Incorrect information is communicated to the users.
Consequence: Significant

Cause: Data were not entered correctly.
Prob: Low
Risk: Acceptable
Rationale: Project QA plans require double data entry or single entry with 100% verification.

Cause: Electronically transmitted data was not loaded correctly.
Prob: Medium
Risk: Unacceptable
PA: The standard CLP reporting format will be required when possible, and standard programs for reading this format will be used to load the data. When the CLP format is unavailable, programs will be written to read the transmitted data, and manual checks will be made to ensure their accuracy.
Resps: Craig Brandt, Denise Schmoyer, Teri Ball, and Beth Nickle
Sch: August 1993
Completed: —
Action: Laboratory statements of work for the projects specify the required reporting format. Data base management plans require manual verification of the load programs written for the project.

Cause: Data validation is inadequate.
Prob: Low
Risk: Acceptable
Rationale: Project procedures for data validation have been prepared.

Cause: Insufficient allocation of resources

Prob: Medium
Risk: Unacceptable
PA: An MOU identifying sufficient resources for the projects will be developed.
Resps: Craig Brandt and Teri Ball
Sch: MOU due on July 30, 1993
Completed: July 26, 1993
Action: MOU is approved by the project managers.

Problem: Data history is not maintained.
Effect: Data are not legally defensible.
Consequence: Significant

Cause: Data changes are not documented.
Prob: Medium
Risk: Unacceptable
PA: An application will be written to automatically maintain a journal of changes for all data tables in the IMS. The journal files will identify the attribute changed, the old value, the new value, the time of the change, the person making the change, and the reason for the change.
Resps: Craig Brandt, Denise Schmoyer, Teri Ball, and Beth Nickle
Sch: —
Completed: —
Action: —

Cause: Data quality is not documented.
Prob: Low
Risk: Acceptable
Rationale: Codes to describe data useability have been defined and will be included in all result tables.

Problem: Bar code or wee reader input device is unavailable.
Effect: Data must be manually entered via keyboard resulting in an increased risk of data input errors.
Consequence: Significant

Cause: Equipment failure
Prob: Medium
Risk: Acceptable
Rationale: The IMS software applications will be written to accept either scanned or keyboard data input. In the instances of keyboard input, the data entry operator will verify the validity of the data entered to minimize the risk of input errors.

10.5.3 Maintain Hardware and Software

Problem: Hardware problems cause data loss.
Effect: Resources have been wasted and project goals cannot be met.
Consequence: Significant

Cause: Power failures
Prob: Low
Risk: Acceptable
Rationale: Emergency power supplies will be available for the project computers to allow an orderly system shutdown.

Cause: Hardware failures
Prob: Medium
Risk: Unacceptable
PA: Data backup schedules will be developed for the projects to minimize loss caused by hardware failure. Daily backups and weekly complete backups will be required.
Resps: Craig Brandt, Denise Schmoyer, Teri Ball, and Beth Nickle
Sch: —
Completed: —
Action: —

Cause: Facility damage from fire or storm
Prob: Low
Risk: Acceptable
PA: Backup files will be maintained on a system in a different building.

Problem: Downtimes for maintenance and upgrades delay project activities.
Effect: Users cannot meet deadlines.
Consequence: Significant

Cause: Unscheduled maintenance
Prob: Low
Risk: Acceptable
Rationale: CSD requires access to an alternate computer for backup.

Cause: Scheduled maintenance and upgrades
Prob: Low
Risk: Acceptable
Rationale: Routine maintenance will be scheduled in advance, and provisions will be made for use of an alternate computer.

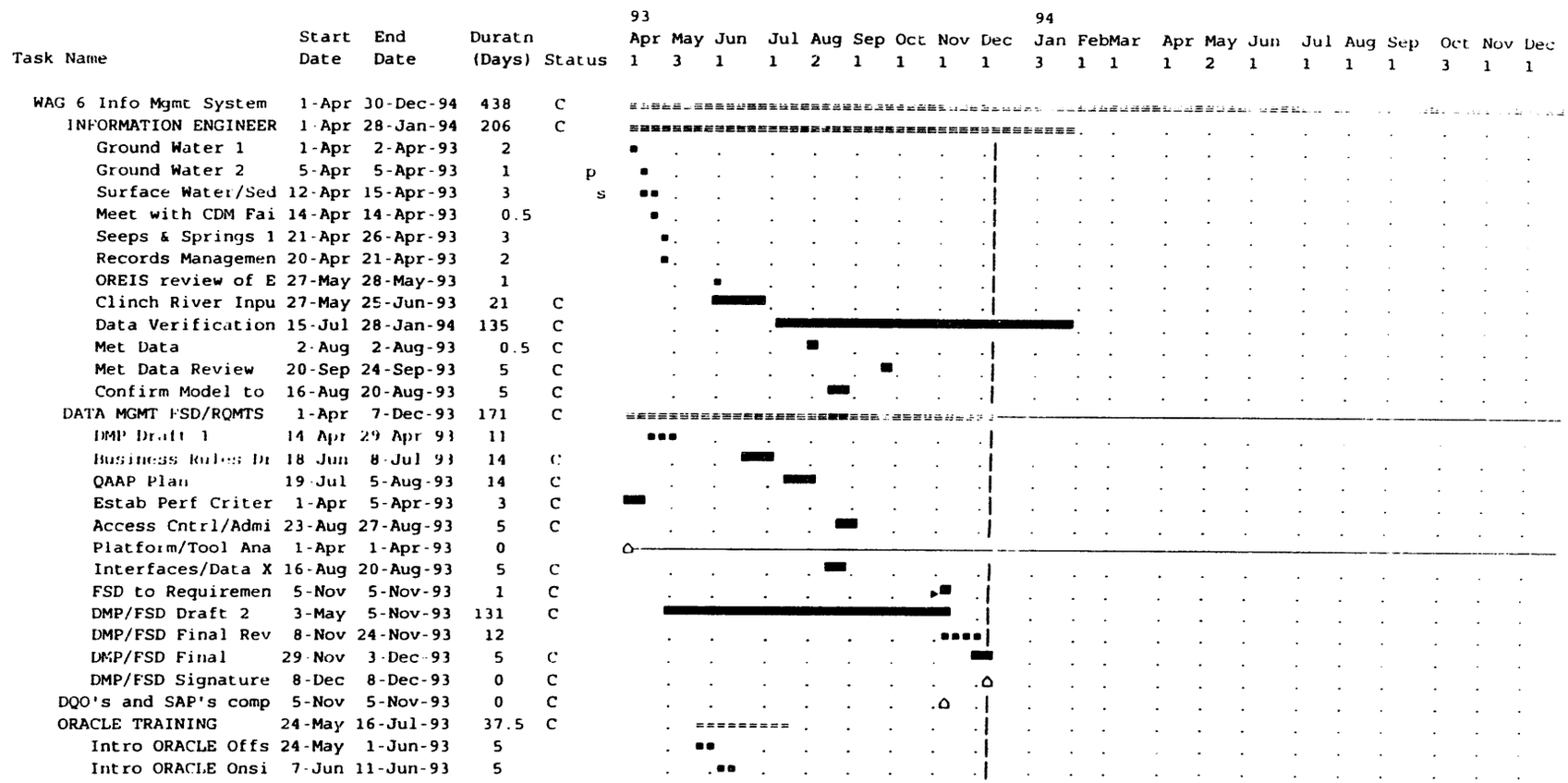
Problem: Documentation of application programs is not current.
Effect: Application is used improperly.
Consequence: Significant

Cause: Standards for program documentation standards were not used.
Prob: Low
Risk: Acceptable
Rationale: The data management plans specify software documentation requirements for the projects.

11. PROJECT SCHEDULE

The project schedule is depicted on the following pages of Sect. 11.

Schedule Name : WAG 6
Responsible : T. S. Ball
As-of Date : 6-Dec-93 9:00am Schedule File : WAG61



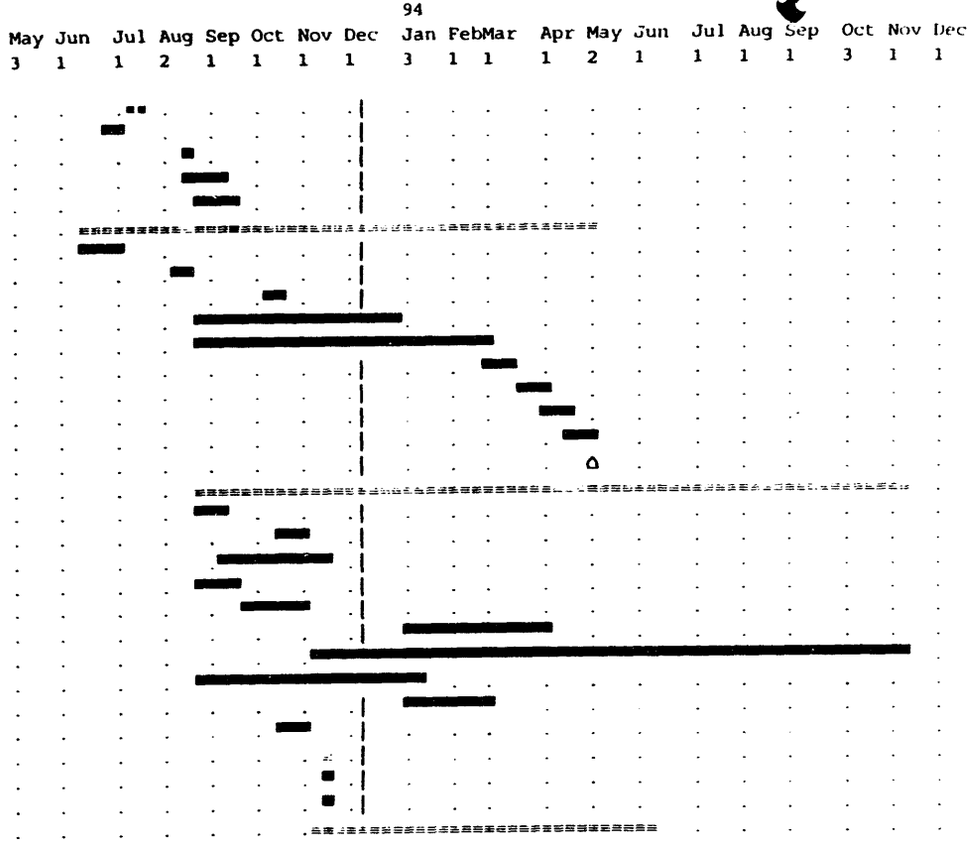
Task Name	Start Date	End Date	Duratn (Days)	Status
WAG 6 Info Mgmt System	1-Apr	30-Dec-94	438	C
INFORMATION ENGINEER	1-Apr	28-Jan-94	206	C
Ground Water 1	1-Apr	2-Apr-93	2	
Ground Water 2	5-Apr	5-Apr-93	1	p
Surface Water/Sed	12-Apr	15-Apr-93	3	s
Meet with CDM Fai	14-Apr	14-Apr-93	0.5	
Seeps & Springs 1	21-Apr	26-Apr-93	3	
Records Managemen	20-Apr	21-Apr-93	2	
OREIS review of E	27-May	28-May-93	1	
Clinch River Inpu	27-May	25-Jun-93	21	C
Data Verification	15-Jul	28-Jan-94	135	C
Met Data	2-Aug	2-Aug-93	0.5	C
Met Data Review	20-Sep	24-Sep-93	5	C
Confirm Model to	16-Aug	20-Aug-93	5	C
DATA MGMT FSD/RQMTS	1-Apr	7-Dec-93	171	C
DMP Draft 1	14-Apr	29-Apr-93	11	
Business Rules Dr	18-Jun	8-Jul-93	14	C
QAAP Plan	19-Jul	5-Aug-93	14	C
Estab Perf Criter	1-Apr	5-Apr-93	3	C
Access Cntrl/Admi	23-Aug	27-Aug-93	5	C
Platform/Tool Ana	1-Apr	1-Apr-93	0	
Interfaces/Data X	16-Aug	20-Aug-93	5	C
FSD to Requiremen	5-Nov	5-Nov-93	1	C
DMP/FSD Draft 2	3-May	5-Nov-93	131	C
DMP/FSD Final Rev	8-Nov	24-Nov-93	12	
DMP/FSD Final	29-Nov	3-Dec-93	5	C
DMP/FSD Signature	8-Dec	8-Dec-93	0	C
DQO's and SAP's comp	5-Nov	5-Nov-93	0	C
ORACLE TRAINING	24-May	16-Jul-93	37.5	C
Intro ORACLE Offs	24-May	1-Jun-93	5	
Intro ORACLE Onsi	7-Jun	11-Jun-93	5	

Detail Task Summary Task Baseline
(Progress) (Progress) Conflict
(Slack) (Slack) Resource delay
Progress shows Percent Achieved on Actual Milestone
Scale: 5 days per character

TIME LINE Gantt Chart Report, Strip 1, Page 1

Schedule Name : WAG 6
Responsible : T. S. Ball
As-of Date : 6-Dec-93 9:00am Schedule File : WAG61

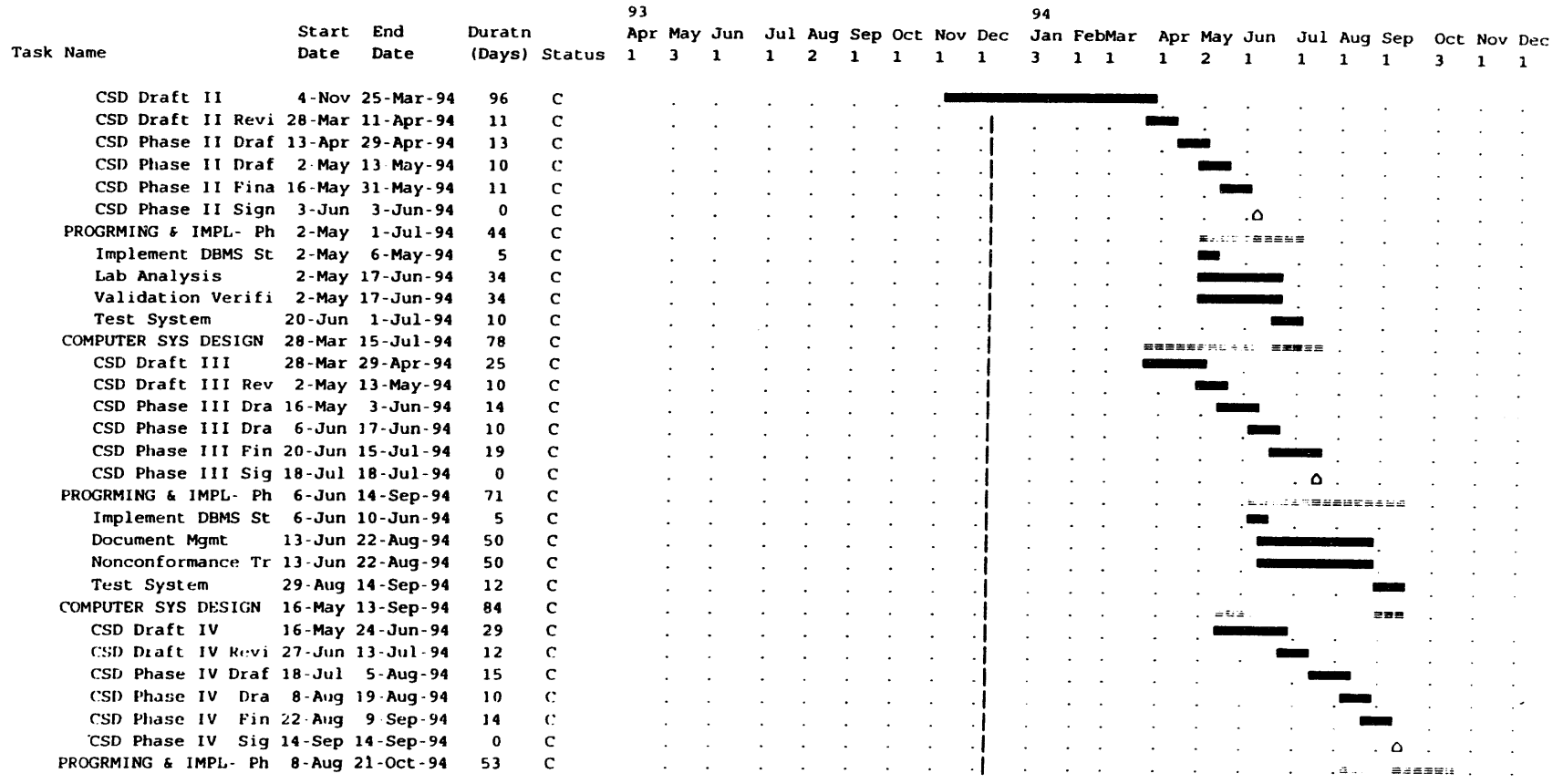
Task Name	Start Date	End Date	Duratn (Days)	Status
ORACLE FORMS &n M	12-Jul	16-Jul-93	5	
CONVERT MODEL FOR CR	28-Jun	2-Jul-93	5	C
2nd DBMS CONSTRUCT	16-Aug	18-Aug-93	3	C
CRRI APPLICATION DES	19-Aug	10-Sep-93	16	C
CRRI PROTOTYPE	23-Aug	17-Sep-93	19	C
COMPUTER SYS DESIGN	14-Jun	29-Apr-94	221	C
Procure hardware	14-Jun	2-Jul-93	15	C
Procure Software	9-Aug	13-Aug-93	5	C
Design WAG 6 Phys	4-Oct	18-Oct-93	10	C
Define Software M	23-Aug	30-Dec-93	89	C
CSD Draft 1	23-Aug	25-Feb-94	127	C
CSD Draft I Revie	28-Feb	14-Mar-94	11	C
CSD Draft 2	17-Mar	1-Apr-94	12	C
CSD Draft 2 Revie	4-Apr	15-Apr-94	10	C
CSD Final	18-Apr	29-Apr-94	10	C
CSD Signature	2-May	2-May-94	0	C
PROGRAMMING AND IMPL	23-Aug	10-Nov-94	307	C
Implement Prototy	23-Aug	10-Sep-93	14	C
Install/Test HW/S	18-Oct	29-Oct-93	10	C
Generate Load Mod	7-Sep	15-Nov-93	48	C
Field Task Maps	23-Aug	17-Sep-93	19	C
Lab Task Maps	20-Sep	29-Oct-93	29	C
Basic Bar Coding	3-Jan	30-Mar-94	61	C
Implement DBMS St	8-Nov	10-Nov-94	254	C
Basic Sample Trac	23-Aug	10-Jan-94	95	C
Change Control	4-Jan	28-Feb-94	38	C
Test System	12-Oct	29-Oct-93	14	C
VALIDATION & ACCEPT	10-Nov	15-Nov-93	3	C
Complete User Tra	10-Nov	12-Nov-93	2	C
Deliver System	15-Nov	15-Nov-93	1	C
COMPUTER SYS DESIGN	4-Nov	2-Jun-94	144	C



Detail Task ≡≡≡≡≡ Summary Task ○○○○○ Baseline
▪▪▬▬ (Progress) ≡≡≡≡≡ (Progress) ▸▸▸ Conflict
▬▬▁▁ (Slack) ≡≡≡▁▁ (Slack) ▪▪▬▬ Resource delay
Progress shows Percent Achieved on Actual △ Milestone
--- Scale: 5 days per character

TIME LINE Gantt Chart Report, Strip 1, Page 2

Schedule Name : WAG 6
Responsible : T. S. Ball
As-of Date : 6-Dec-93 9:00am Schedule File : WAG61

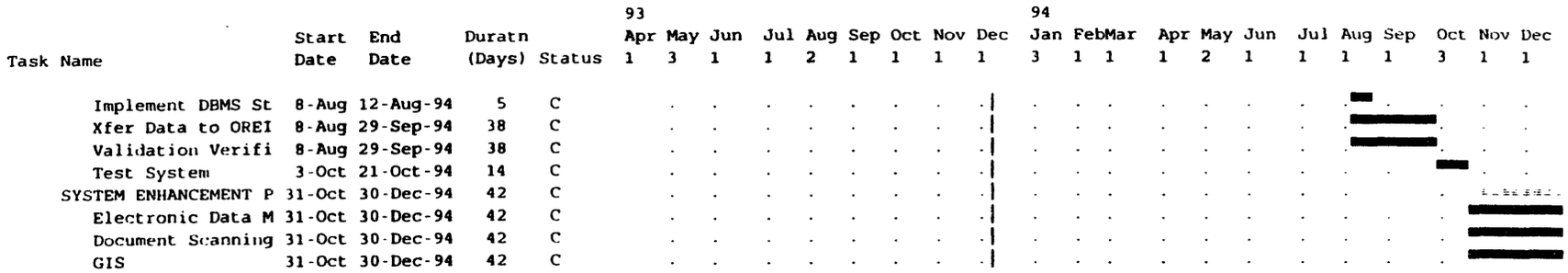


Task Name	Start Date	End Date	Duratn (Days)	Status
CSD Draft II	4-Nov	25-Mar-94	96	C
CSD Draft II Revi	28-Mar	11-Apr-94	11	C
CSD Phase II Draf	13-Apr	29-Apr-94	13	C
CSD Phase II Draf	2-May	13-May-94	10	C
CSD Phase II Fina	16-May	31-May-94	11	C
CSD Phase II Sign	3-Jun	3-Jun-94	0	C
PROGRMING & IMPL- Ph	2-May	1-Jul-94	44	C
Implement DBMS St	2-May	6-May-94	5	C
Lab Analysis	2-May	17-Jun-94	34	C
Validation Verifi	2-May	17-Jun-94	34	C
Test System	20-Jun	1-Jul-94	10	C
COMPUTER SYS DESIGN	28-Mar	15-Jul-94	78	C
CSD Draft III	28-Mar	29-Apr-94	25	C
CSD Draft III Rev	2-May	13-May-94	10	C
CSD Phase III Dra	16-May	3-Jun-94	14	C
CSD Phase III Dra	6-Jun	17-Jun-94	10	C
CSD Phase III Fin	20-Jun	15-Jul-94	19	C
CSD Phase III Sig	18-Jul	18-Jul-94	0	C
PROGRMING & IMPL- Ph	6-Jun	14-Sep-94	71	C
Implement DBMS St	6-Jun	10-Jun-94	5	C
Document Mgmt	13-Jun	22-Aug-94	50	C
Nonconformance Tr	13-Jun	22-Aug-94	50	C
Test System	29-Aug	14-Sep-94	12	C
COMPUTER SYS DESIGN	16-May	13-Sep-94	84	C
CSD Draft IV	16-May	24-Jun-94	29	C
CSD Draft IV Revi	27-Jun	13-Jul-94	12	C
CSD Phase IV Draf	18-Jul	5-Aug-94	15	C
CSD Phase IV Dra	8-Aug	19-Aug-94	10	C
CSD Phase IV Fin	22-Aug	9-Sep-94	14	C
CSD Phase IV Sig	14-Sep	14-Sep-94	0	C
PROGRMING & IMPL- Ph	8-Aug	21-Oct-94	53	C

Detail Task Summary Task Baseline
(Progress) (Progress) Conflict
(Slack) (Slack) Resource delay
Progress shows Percent Achieved on Actual Milestone
Scale: 5 days per character

TIME LINE Gantt Chart Report, Strip 1, Page 3

Schedule Name WAG 6
Responsible : T. S. Ball
As-of Date : 6-Dec-93 9:00am Schedule File : WAG61



Detail Task ≡≡≡≡≡ Summary Task °°°°° Baseline
(Progress) ==*== (Progress) ▸▸▸ Conflict
(Slack) ≡≡≡—— (Slack) Resource delay
Progress shows Percent Achieved on Actual ◊ Milestone
---------- Scale: 5 days per character ----------

TIME LINE Gantt Chart Report, Strip 1, Page 4

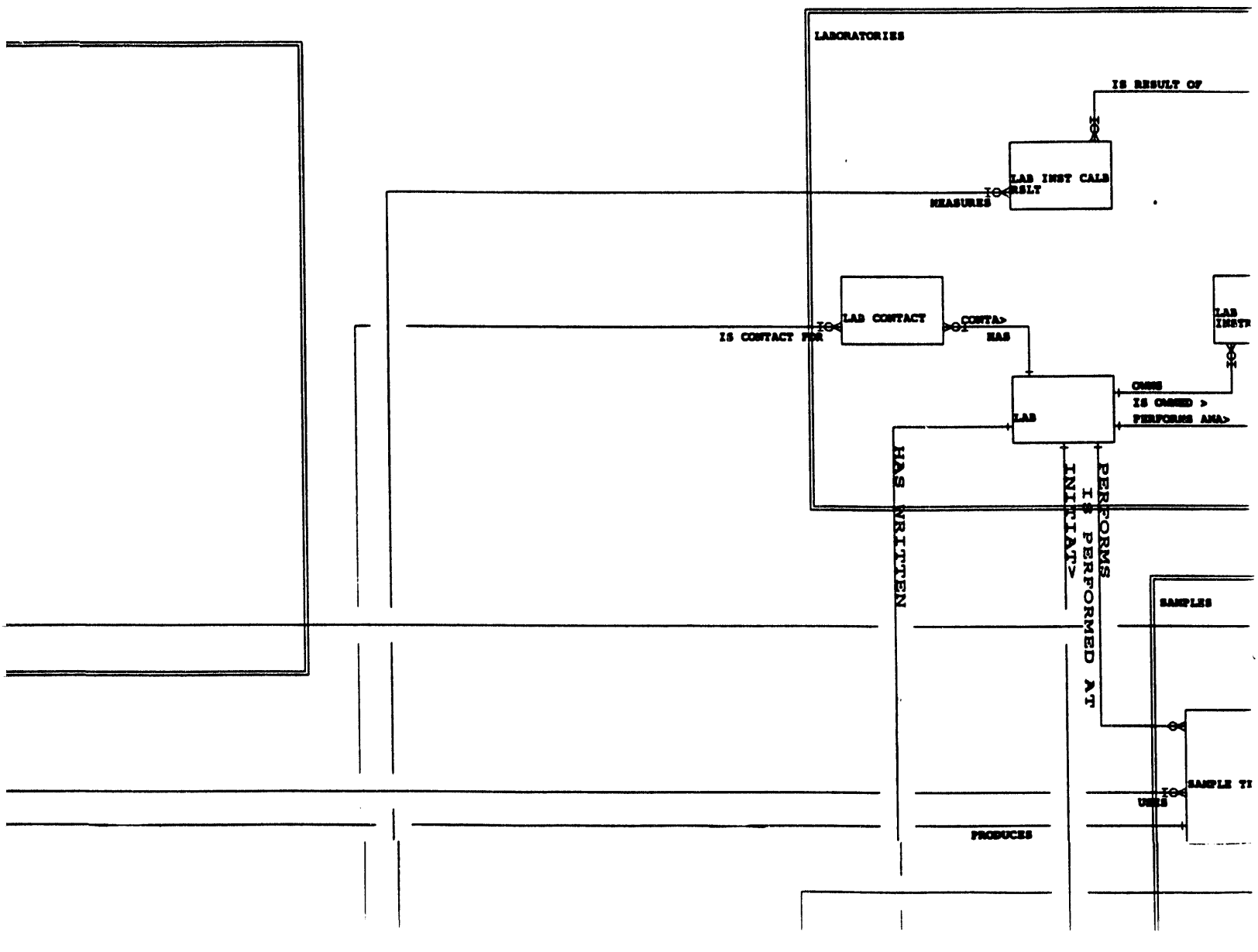
Appendix A

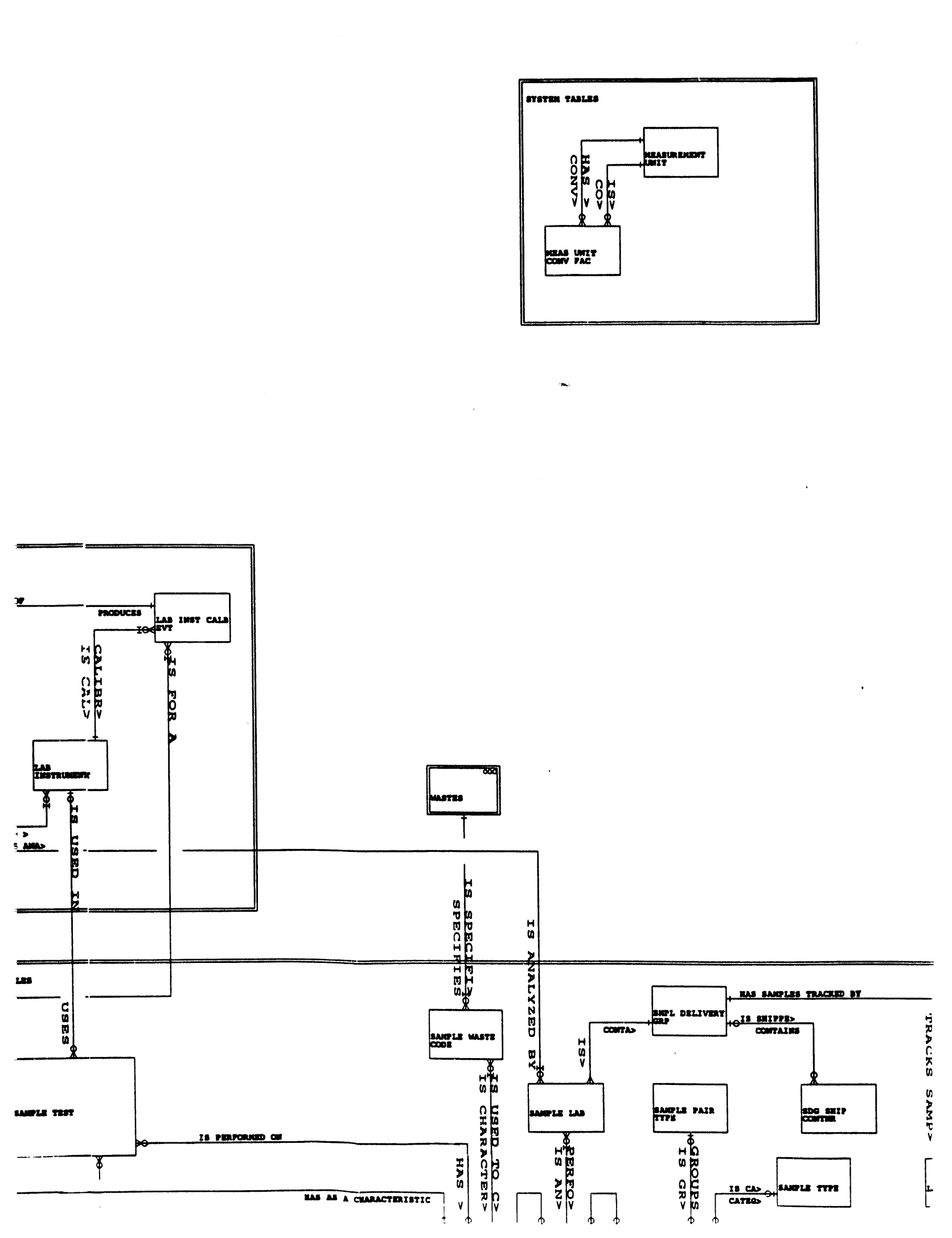
ENTITY RELATIONSHIP DIAGRAM

Appendix A contains the entity relationship diagram that shows the data and the relationships between the data required to support the system. The single line boxes represent entities that are data of interest to the project. The double-lined boxes are subject areas that are logical groupings of entities.

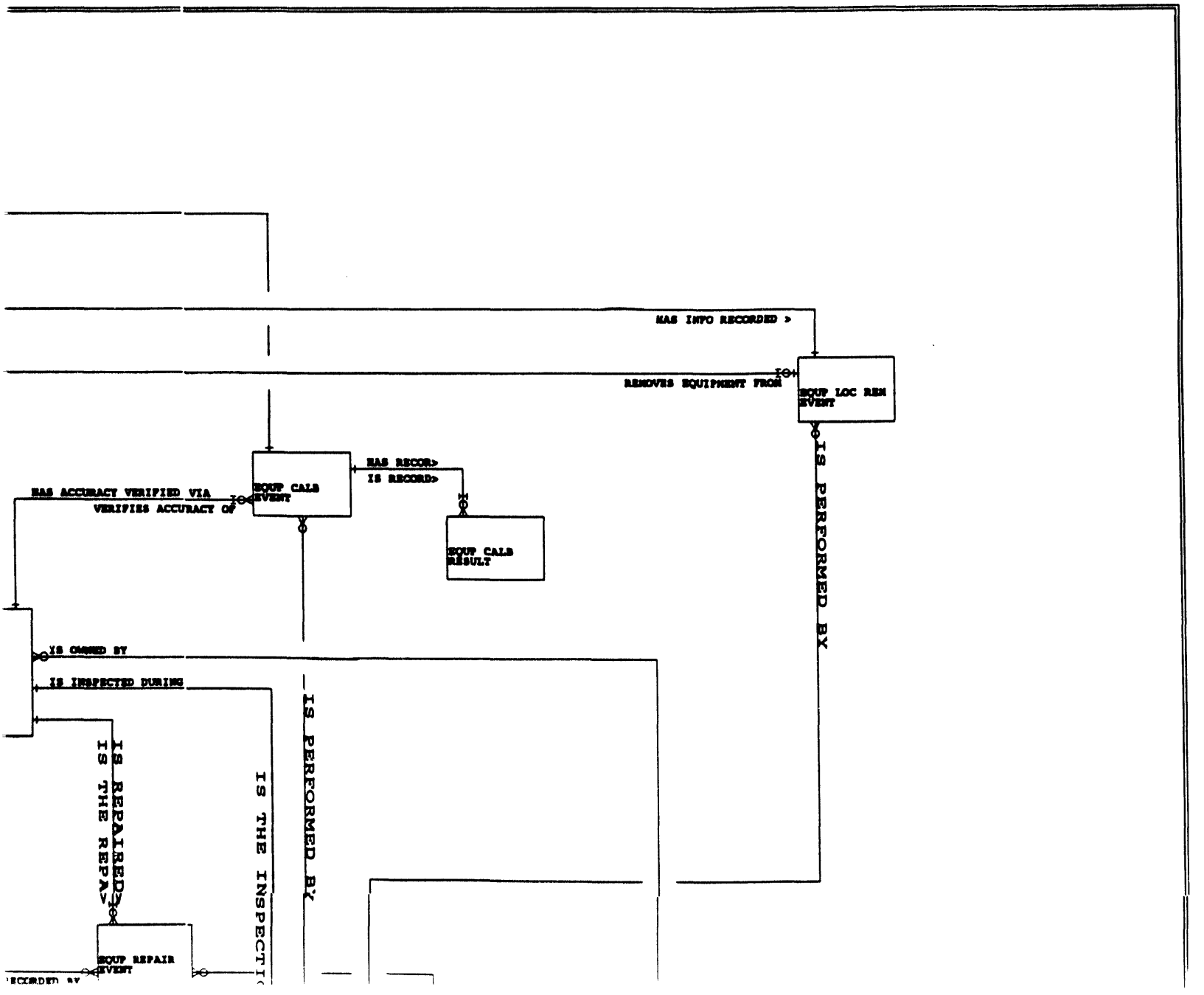
The lines between the boxes represent relationships between the entities. These relationships can be optional or mandatory. Optional relationships are designated by an O placed on one end of the relationship line. Mandatory relationships are designated with a tick mark (|). Relationships may be one-to-many or one-to-one. Relationships are assumed to be one-to-one unless marked by a crow's foot, which identifies a one-to-many relationship.

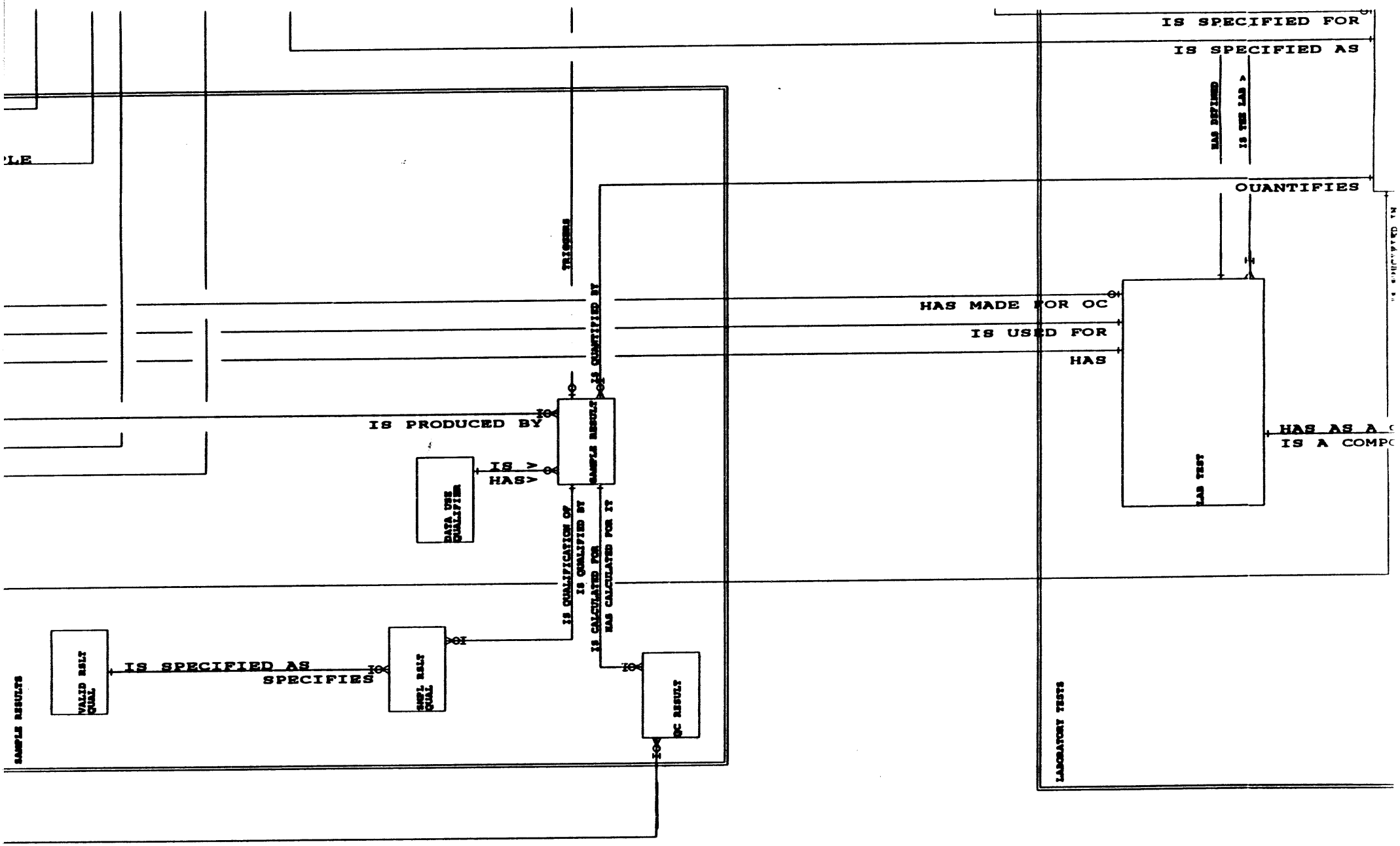
QC TYPES
REF MATL ANALYTE
HAD U>
SPECIFIES
IS<
IS MADE FOR
REFERENCE MATERIAL
IS USED TO PERFORM
IS PERFORMED USING
HAS<
IS<
IS SURROGATE ADDED >
QC TYPE COMPONENT
IS REQUIRE VALUE ENTRY FOR
HAS AS REQUIRED VALUE ENTRY
QC SMPL REF MATL
HAS DEFINED FOR IT
HAS IDENTIFIED FOR IT
QC TYPE
CATEGORIZES
HAS AS AN INSTANCE
SPECIFIES AS QC SA

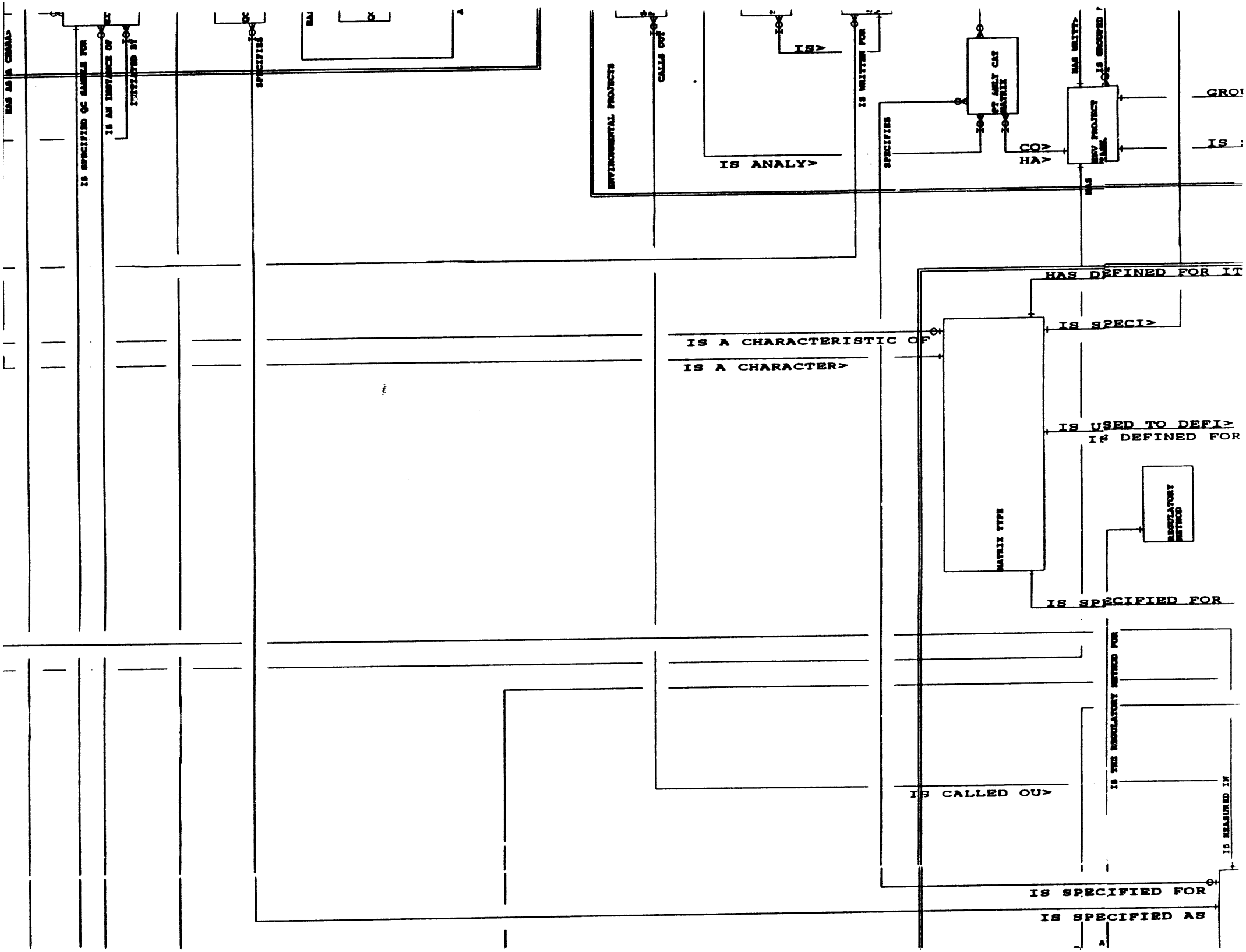

LABORATORIES
IS RESULT OF
LAB INST CALB RSLT
MEASURES
LAB CONTACT
IS CONTACT FOR
CONTA>
HAS
LAB
OWNS
IS OWNED >
PERFORMS ANA>
HAS WRITTEN
INITIAT>
IS PERFORMED AT
PERFORMS
SAMPLES
SAMPLE TI
USES
PRODUCES

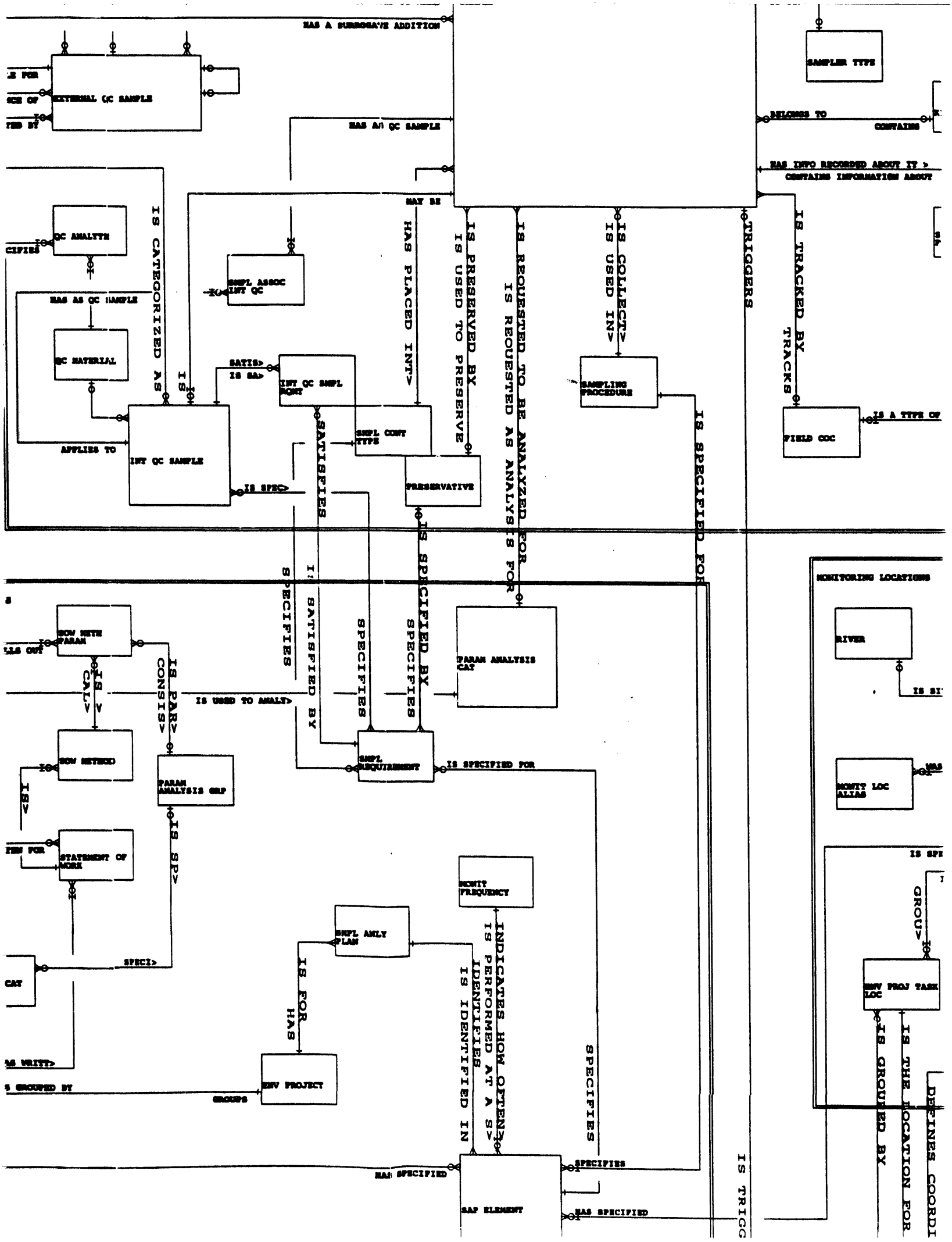

SYSTEM TABLES
MEASUREMENT UNIT
HAS V CONV>
IS> CO>
MEAS UNIT CONV FAC
PRODUCES
LAB INST CALB EVT
IS CAL> CALIBR>
IS FOR A
LAB INSTRUMENT
IS USED IN
USES
WASTES
IS SPECIFIED IN SPECIFIES
IS ANALYZED BY
SAMPLE WASTE CODE
IS USED TO CH IS CHARACTER>
SAMPLE TEST
IS PERFORMED ON
HAS AS A CHARACTERISTIC
HAS V
SAMPLE LAB
IS AN PEREQ>
SMPL DELIVERY GRP
CONTA>
IS>
HAS SAMPLES TRACKED BY
IS SHIPPE>
CONTAINS
SAMPLE PAIR TYPE
IS GR> GROUPS
SDG SHIP CONTNR
IS CA> CATEG>
SAMPLE TYPE
TRACKS SAMP>

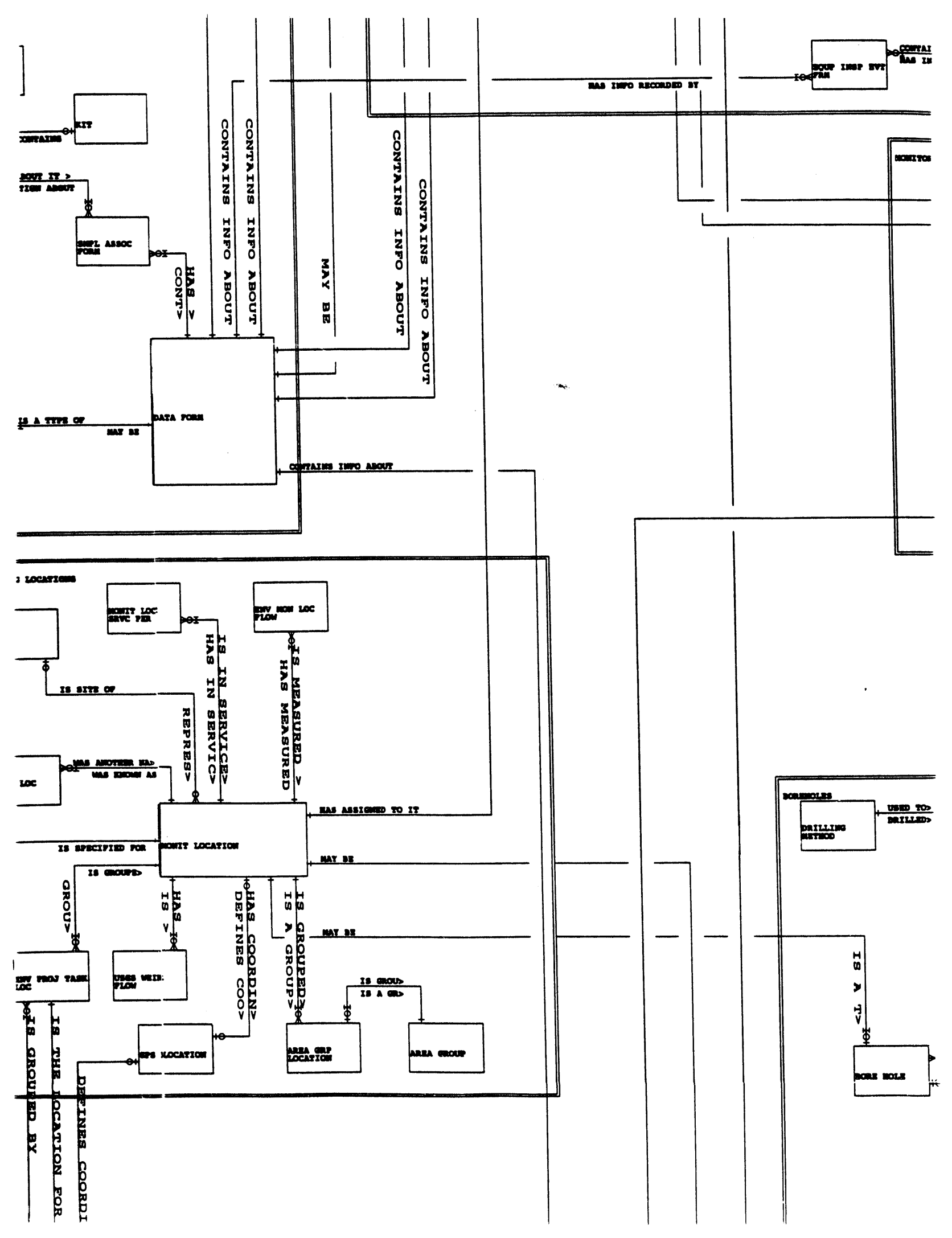
FLD EQUIPMENT
EQUP CALB EVT FRM
CONTAINS INFO ABOUT
EQUP REM EVT FRM
CONTAINS INFO ABOUT
HAS INFO RECORDED BY
HAS INFO RECORDED BY
IS ASSIGNED TO
EQUP LOC INIT EVT
HAS EQUIPMENT REMOVED BY
HAS INFO RECORDED BY
CONTAINS INFO ABO>
IS PERFORMED BY
HAS ASSIGNE>
IS ASSIGNED>
HAS
FIELD EQUIPMENT
IS
IS
EQUP INIT EVT FRM
HAS INFO RECORDED BY
IS ENTERED IN>
IS USED TO <
TRACKS SAMP>
LAB CDC
IS A TYPE OF
S INFO RECORDED

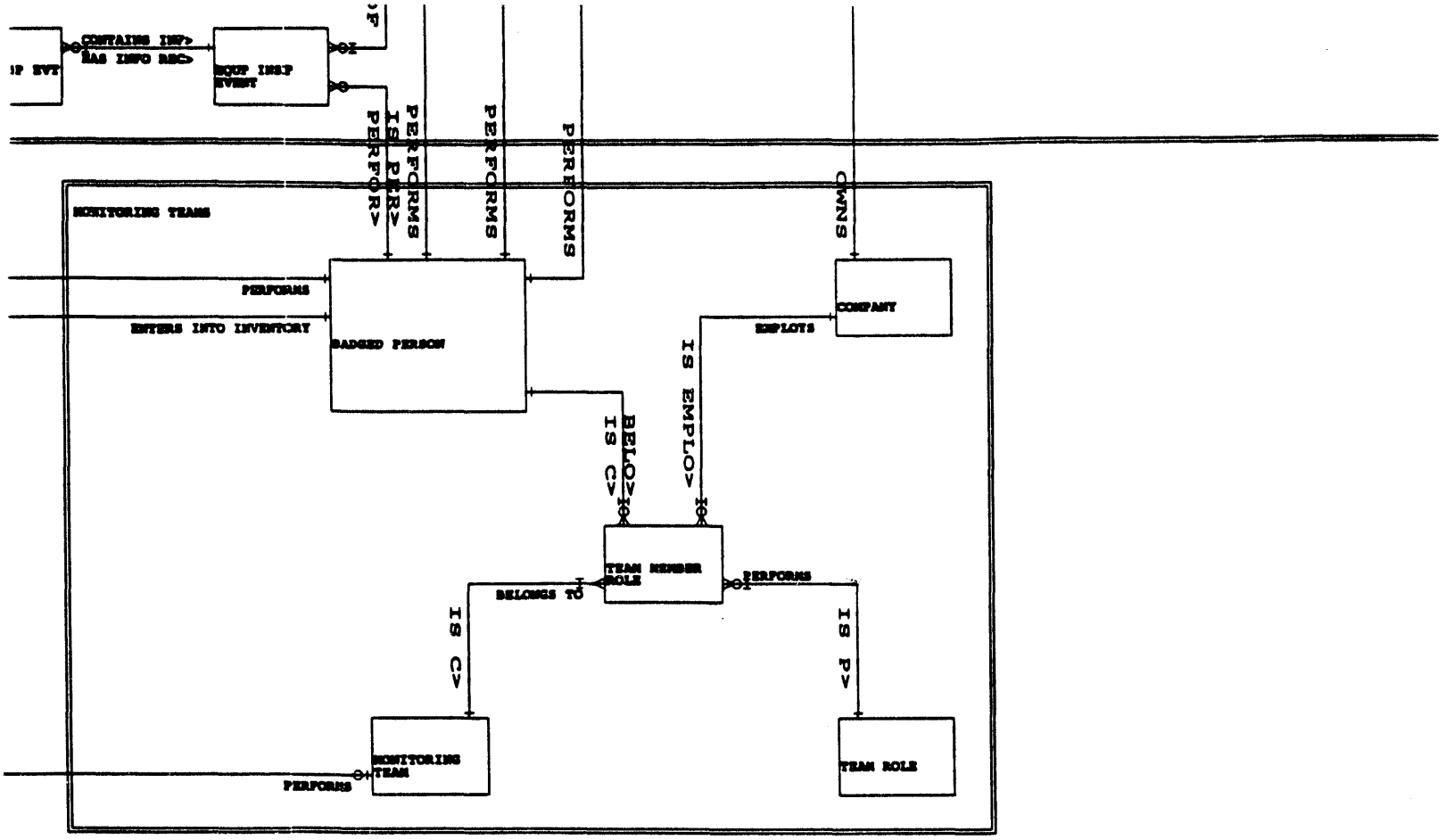

HAS INFO RECORDED >
REMOVES EQUIPMENT FROM
EQUP LOC REM EVENT
IS PERFORMED BY
HAS RECOR>
IS RECORD>
HAS ACCURACY VERIFIED VIA
VERIFIES ACCURACY OF
EQUP CALB EVENT
EQUP CALB RESULT
IS OWNED BY
IS INSPECTED DURING
IS REPAIRED>
IS THE REPAI>
IS THE INSPECTI
IS PERFORMED BY
EQUP REPAIR EVENT

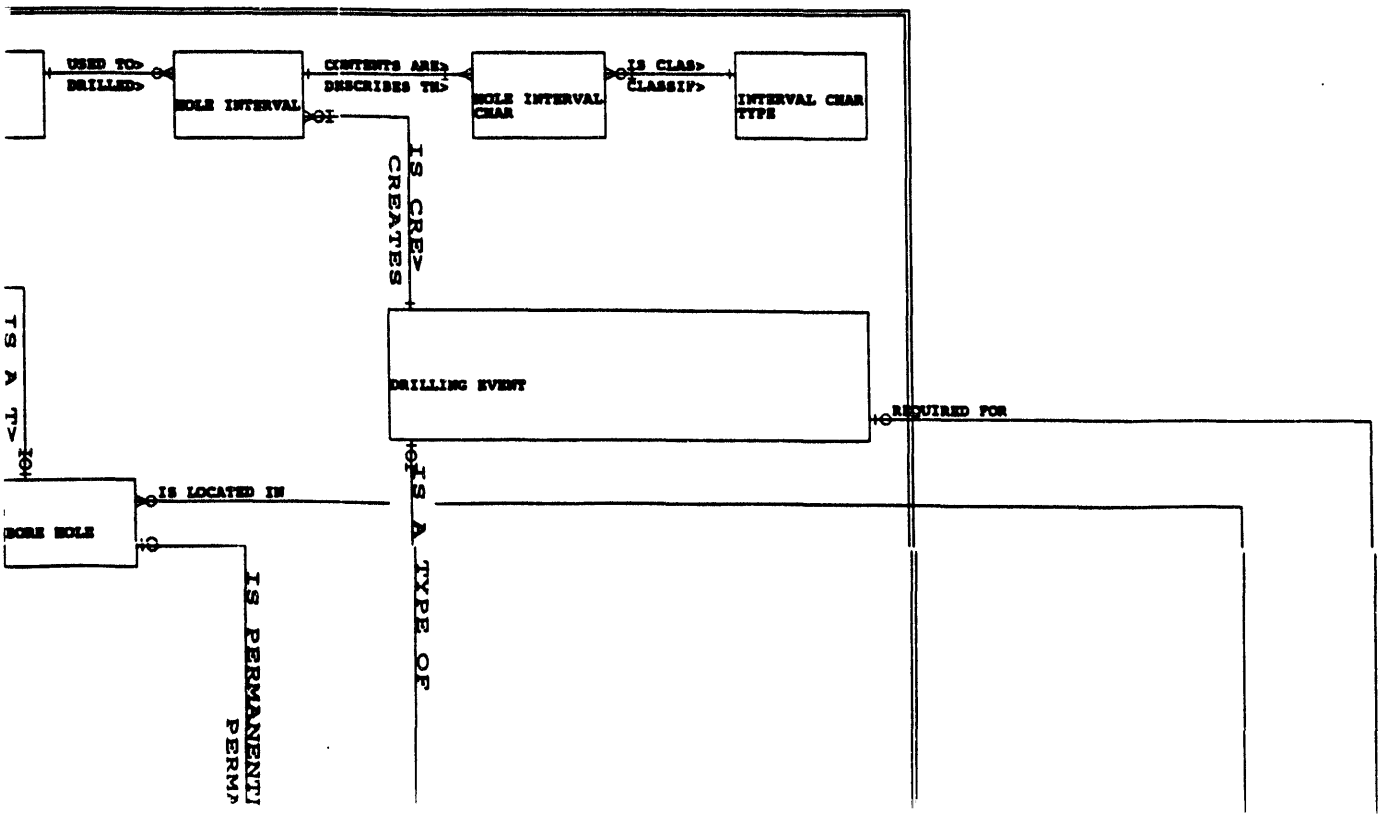

IS SPECIFIED FOR
IS SPECIFIED AS
HAS DEFINED
IS THE LAB A
QUANTIFIES
TRIGGERS
IS QUANTIFIED BY
HAS MADE FOR QC
IS USED FOR
HAS
IS PRODUCED BY
IS
HAS
DATA USE QUALIFIER
SAMPLE RESULT
LAB TEST
HAS AS A
IS A COMPO
IS QUALIFICATION OF
IS QUALIFIED BY
IS CALCULATED FOR
HAS CALCULATED FOR IT
VALID RSLT QUAL
IS SPECIFIED AS
SPECIFIES
SMPL RSLT QUAL
QC RESULT
SAMPLE RESULTS
LABORATORY TESTS

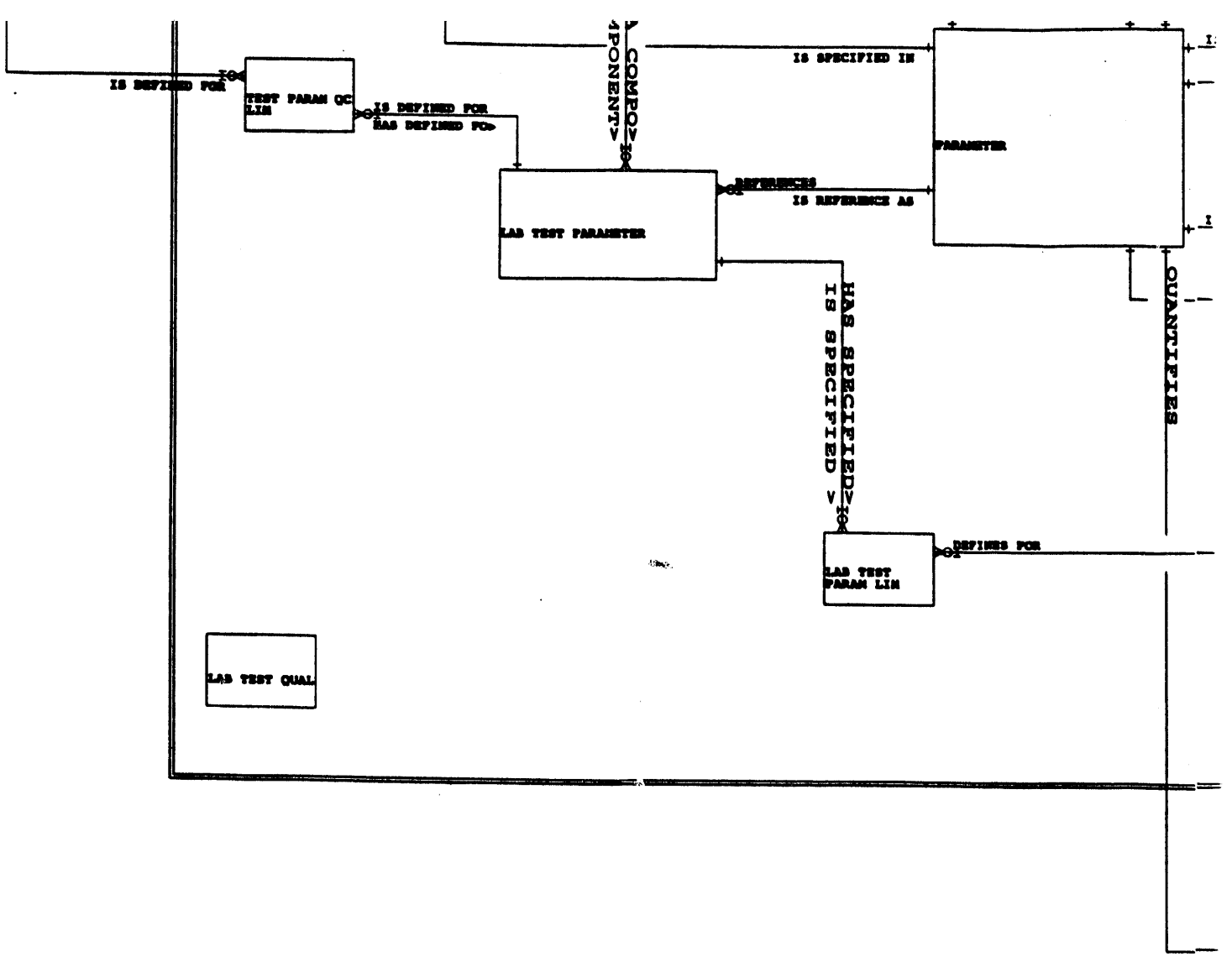

IS>
IS ANALY>
CO>
HA>
GRO
IS
HAS DEFINED FOR IT
IS SPECI>
IS A CHARACTERISTIC OF
IS A CHARACTER>
IS USED TO DEFI>
IS DEFINED FOR
IS SPECIFIED FOR
IS CALLED OU>
IS SPECIFIED FOR
IS SPECIFIED AS

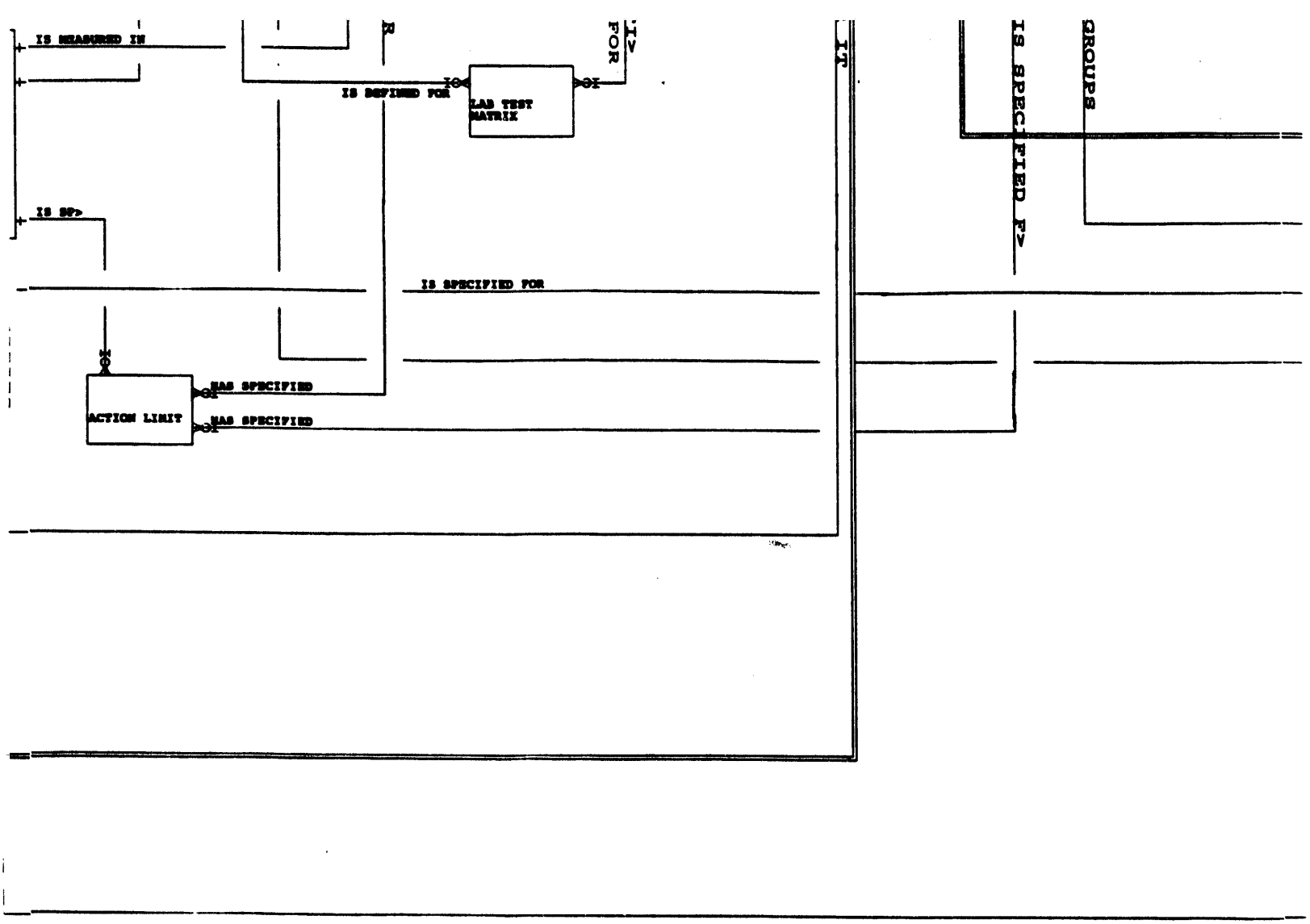

HAS A SURROGATE ADDITION
EXTERNAL QC SAMPLE
HAS AN QC SAMPLE
SAMPLER TYPE
BELONGS TO
CONTAINS
HAS INFO RECORDED ABOUT IT >
CONTAINS INFORMATION ABOUT
MAY BE
IS CATEGORIZED AS
QC ANALYTE
HAS AS QC SAMPLE
QC MATERIAL
SMPL ASSOC INT QC
HAS PLACED INT>
IS PRESERVED BY
IS USED TO PRESERVE
IS REQUESTED AS ANALYSIS FOR
IS COLLECT>
IS USED IN>
TRIGGERS
IS TRACKED BY
TRACKS
SATIS>
IS SA>
INT QC SMPL MGMT
SAMPLING PROCEDURE
FIELD QOC
IS A TYPE OF
APPLIES TO
INT QC SAMPLE
SMPL CONT TYPE
PRESERVATIVE
IS SPEC>
SATISFIES
IS SPECIFIED FOR
SPECIFIES
IS SPECIFIED BY
MONITORING LOCATIONS
RIVER
SOW WITH PARAM
IS CAT>
IS PAR CONSIS>
IS USED TO ANALY>
PARAM ANALYSIS CAT
SOW METHOD
PARAM ANALYSIS GRP
SMPL REQUIREMENT
IS SPECIFIED FOR
MONIT LOC ALIAS
STATEMENT OF WORK
IS SPC>
MONIT FREQUENCY
SMPL ANLY PLAN
INDICATES HOW OFTEN
IS PERFORMED AT A S>
IS IDENTIFIED IN
IS FOR
HAS
SPECI>
ENV PROJECT
GROUPS
ENV PROJ TASK LOC
IS GROUPED BY
IS THE LOCATION FOR
DEFINES COORDI
HAS SPECIFIED
SAP ELEMENT
SPECIFIES
IS TRIGG

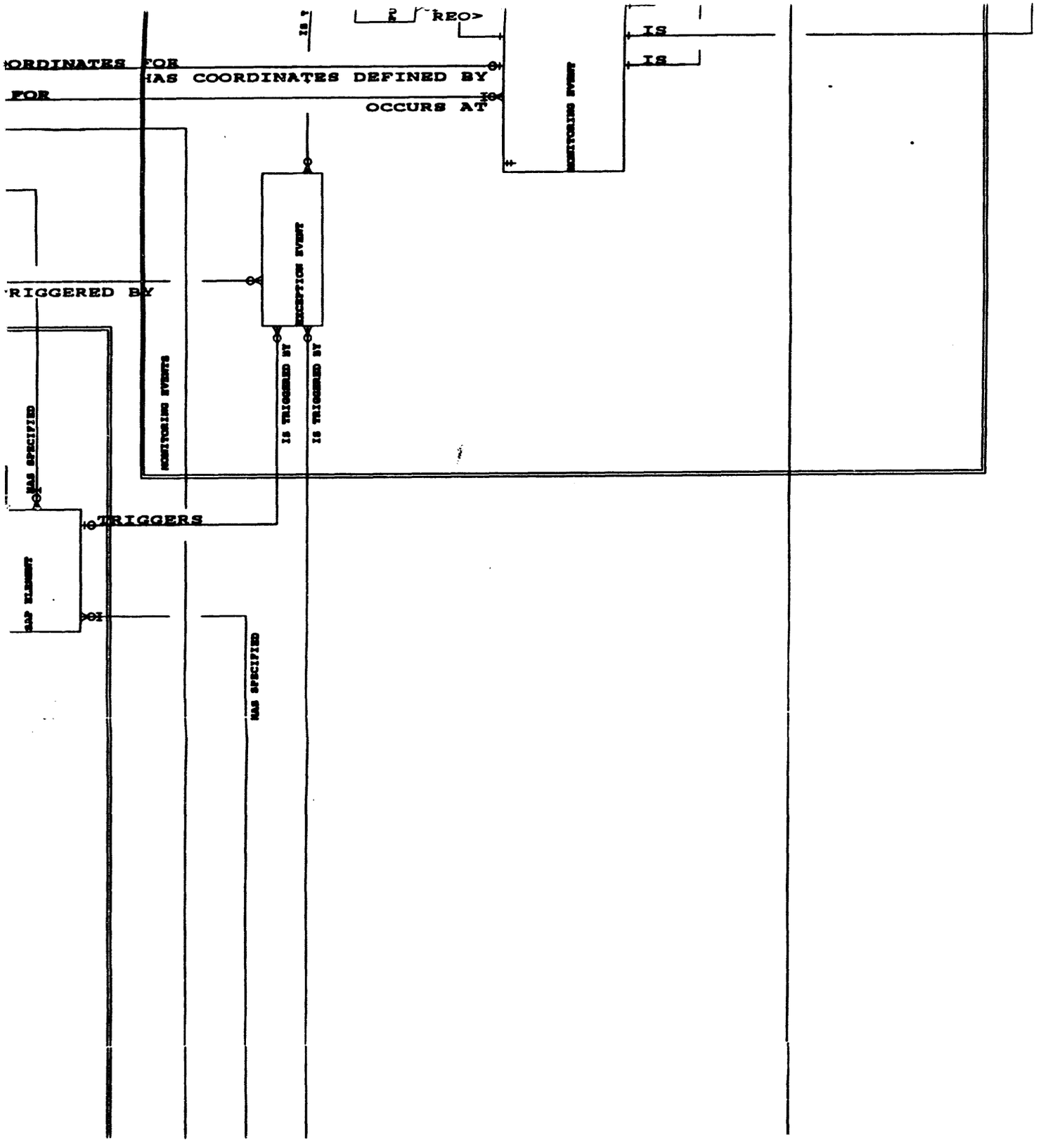

KIT
CONTAINS
CONTAINS INFO ABOUT
CONTAINS INFO ABOUT
MAY BE
CONTAINS INFO ABOUT
CONTAINS INFO ABOUT
HAS INFO RECORDED BY
SOUP INSP SVY FRM
MONITOR
SHPL ASSOC FORM
HAS V
CONT>
DATA FORM
IS A TYPE OF
MAY BE
CONTAINS INFO ABOUT
LOCATIONS
MONIT LOC SRVC PER
ENV MON LOC FLOW
IS IN SERVICE>
HAS IN SERVIC>
IS MEASURED >
HAS MEASURED
IS SITE OF
REPRES>
LOC
WAS ANOTHER NA>
WAS KNOWN AS
HAS ASSIGNED TO IT
MONIT LOCATION
IS SPECIFIED FOR
MAY BE
IS GROUPS>
GROU>
IS V
HAS
HAS COORDIN>
DEFINES COO>
IS GROUPED>
IS A GROUP>
MAY BE
ENV PROJ TASK LOC
USGS WEIR FLOW
IS GROU>
IS A GR>
GPS LOCATION
AREA GRP LOCATION
AREA GROUP
IS GROUPED BY
IS THE LOCATION FOR
DEFINES COORDI
BOREHOLES
USED TO>
DRILLED>
DRILLING METHOD
IS A T>
BORE HOLE

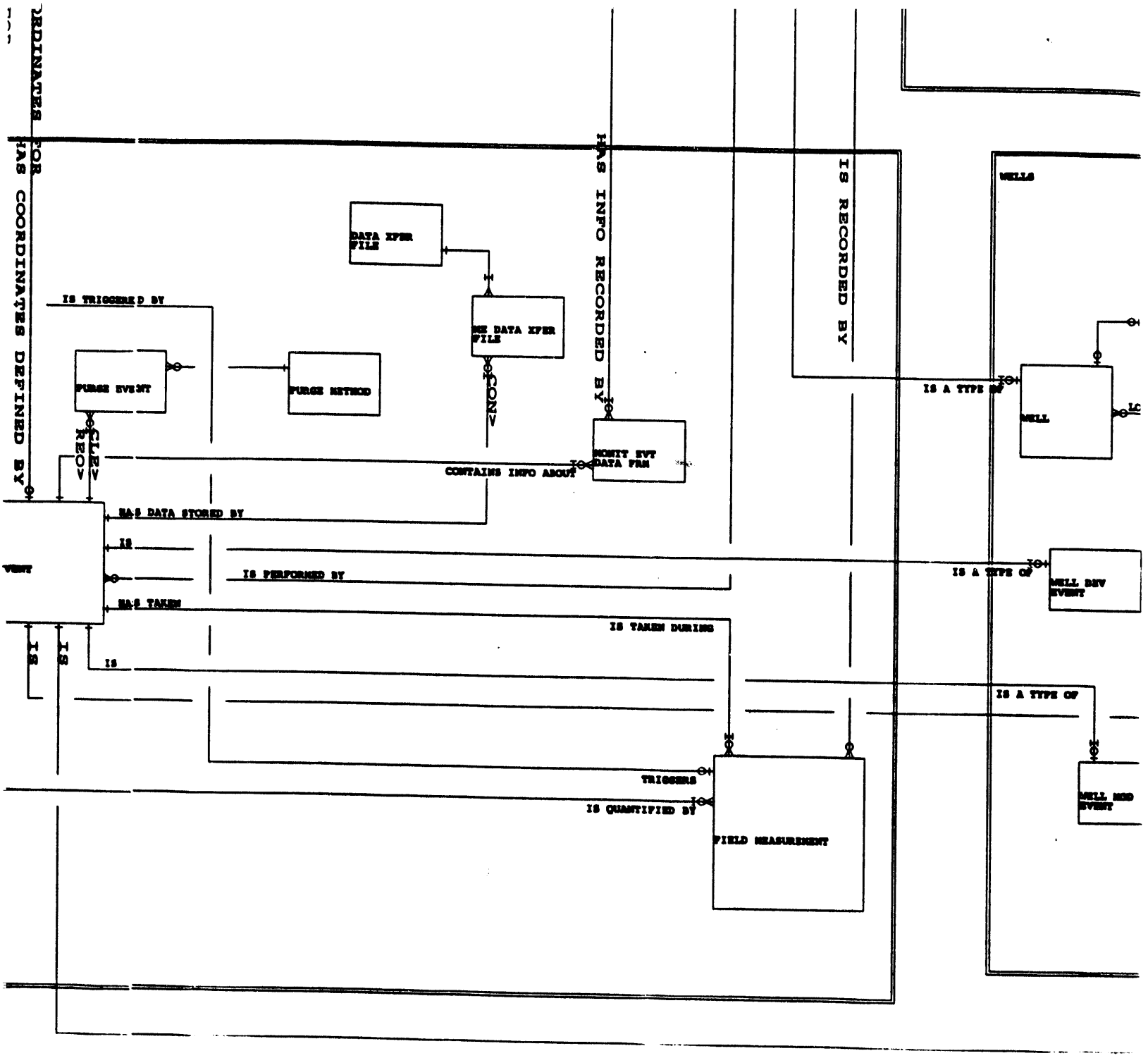

CONTAINS INF>
HAS INFO REC>
EQUP INSP EVENT
IS PERFOR>
PERFORMS
PERFORMS
PERFORMS
OWNS
MONITORING TEAMS
PERFORMS
ENTERS INTO INVENTORY
BADGED PERSON
COMPANY
EMPLOYS
IS EMPLOY>
IS C>
BELOW>
TEAM MEMBER ROLE
BELONGS TO
PERFORMS
IS C>
IS P>
MONITORING TEAM
PERFORMS
TEAM ROLE

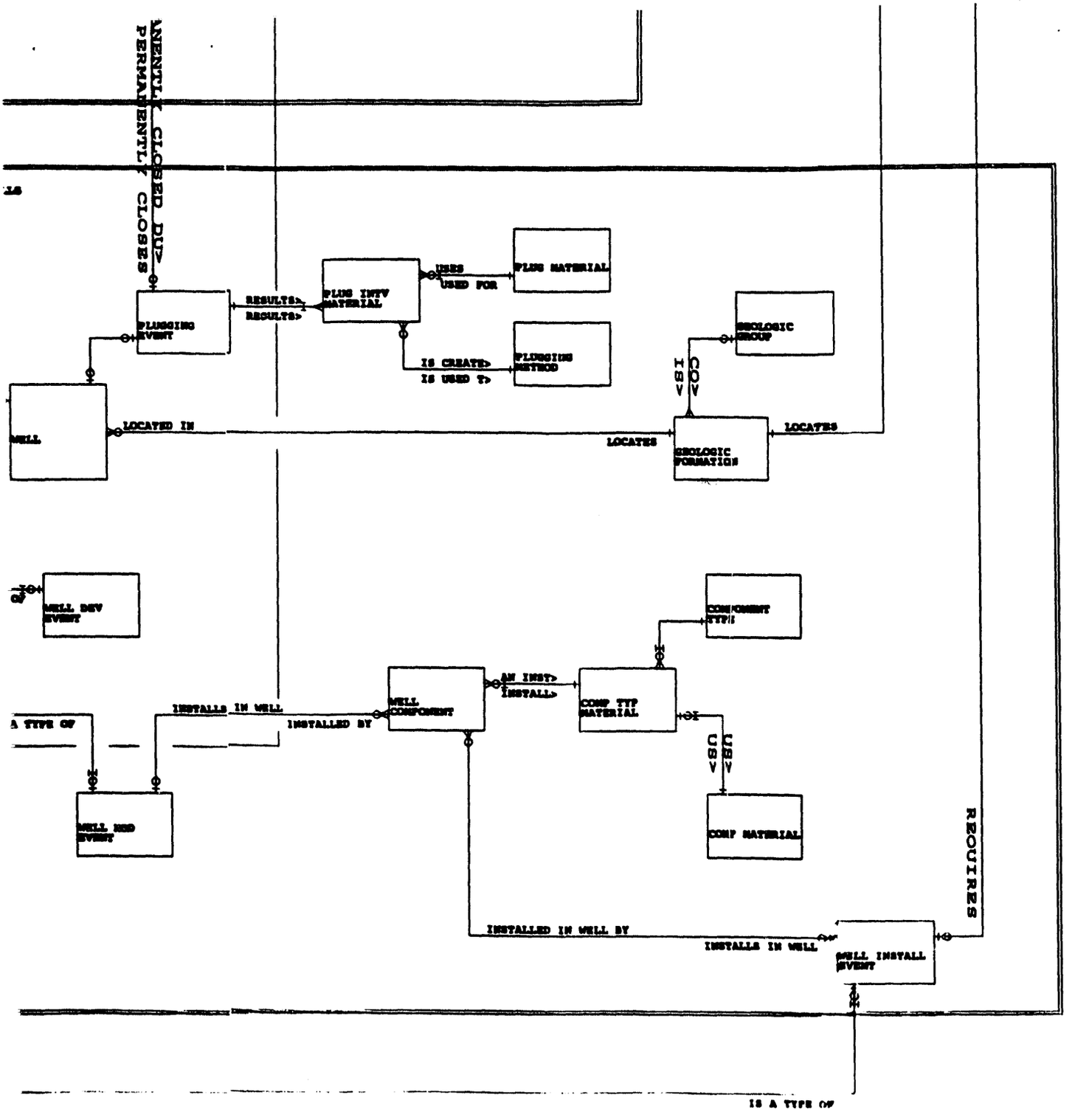

USED TO>
DRILLED>
HOLE INTERVAL
CONTENTS ARE>
DESCRIBES TH>
HOLE INTERVAL CHAR
IS CLAS>
CLASSIF>
INTERVAL CHAR TYPE
IS CRE>
CREATES
DRILLING EVENT
REQUIRED FOR
TS A T>
IS LOCATED IN
BORE HOLE
IS A TYPE OF
IS PERMANENTI
PERMA


IS DEFINED FOR
TEST PARAM QC LIM
IS DEFINED FOR
HAS DEFINED FO
COMPONENT
IS SPECIFIED IN
PARAMETER
LAB TEST PARAMETER
REFERENCES
IS REFERENCE AS
QUANTIFIES
HAS SPECIFIED
IS SPECIFIED
DEFINES FOR
LAB TEST PARAM LIM
LAB TEST QUAL


IS MEASURED IN
IS DEFINED FOR
LAB TEST MATRIX
IS SPECIFIED FOR
IS SPECIFIED FOR
GROUPS
IS SP>
IS SPECIFIED FOR
ACTION LIMIT
HAS SPECIFIED
HAS SPECIFIED


REQ>
IS
IS
ORDINATES FOR
HAS COORDINATES DEFINED BY
FOR
OCCURS AT
MONITORING EVENT
EXCEPTION EVENT
RIGGERED BY
MONITORING EVENTS
IS TRIGGERED BY
IS TRIGGERED BY
HAS SPECIFIED
TRIGGERS
MAP ELEMENT
HAS SPECIFIED


RDINATES
HAS COORDINATES DEFINED BY
DATA XFER FILE
IS TRIGGERED BY
HE DATA XFER FILE
PURGE EVENT
PURGE METHOD
CONT
HAS INFO RECORDED BY
IS RECORDED BY
WELLS
IS A TYPE OF
WELL
LC
REC
CLE
MONIT EVT DATA FRM
CONTAINS INFO ABOUT
WA'S DATA STORED BY
IS
IS PERFORMED BY
IS A TYPE OF
WELL DEV EVENT
WA'S TAKEN
IS TAKEN DURING
IS
IS
IS
IS A TYPE OF
TRIGGERS
IS QUANTIFIED BY
FIELD MEASUREMENT
WELL MED EVENT


PERMANENTLY CLOSED DU>
PERMANENTLY CLOSES
PLUGGING EVENT
RESULTS>
RESULTS>
PLUG INTV MATERIAL
USES
USED FOR
PLUG MATERIAL
IS CREATED>
IS USED T>
PLUGGING METHOD
GEOLOGIC GROUP
IS>
CONTAINS
LOCATED IN
LOCATES
LOCATES
GEOLOGIC FORMATION
WELL
WELL DEV EVENT
COMPONENT TYPE
AN INST>
INSTALL>
COMP TYP MATERIAL
INSTALLS IN WELL
INSTALLED BY
WELL COMPONENT
A TYPE OF
USE>
USE>
WELL MOD EVENT
COMP MATERIAL
REQUIRES
INSTALLED IN WELL BY
INSTALLS IN WELL
WELL INSTALL EVENT
IS A TYPE OF

Appendix B

ENTITY HIERARCHY REPORT

Appendix B contains the entity hierarchy report. It contains an alphabetic list of the entities with their corresponding attributes. An attribute is a distinct piece of information kept about an entity.

Entity Hierarchy

Model : WAG6
Subset: (complete model)
Nov. 17, 1993 09:16

Entity: ACTION_LIMIT
Attrs:
- ACT_LIM_CLOSED_DTE
- ACT_LIM_EFFECT_DTE
- ACT_LIM_UNIT
- ACT_LIM_VAL

Entity: AREA_GROUP
Attrs:
- AREA_GRP_NAM
- AREA_GRP_TYP
- AREA_GRP_DESC
- AREA_GRP_ID

Entity: AREA_GRP_LOCATION
Attrs:
- AG_LOC_BEG_DTE
- AG_LOC_END_DTE
- AG_LOC_PURG_SEQ

Entity: BADGED_PERSON
Attrs:
- BDGD_PRSN_UID
- BDGD_PRSN_LAST_NAM
- BDGD_PRSN_MID_NAM
- BDGD_PRSN_FRST_NAM
- BDGD_PRSN_BADGE_NO

Entity: BORE_HOLE
Attrs:
- BH_PERMIT_NO
- BH_ROCK_CORE_DESC
- BH_DRAW_NO
- BH_RPT_NO
- BH_RPT_TITLE
- BH_RPT_DRAW_DTE
- BH_COMMENT
- BH_CONV_WELL_FLG
- BH_DPTH
- BH_ROCK_DPTH
- BH_INIT_WTR_DPTH
- BH_DIAM_UNIT
- BH_DIAM

Entity: COMPANY
Attrs:
- CO_NAM
- CO_CODE

Entity: COMPONENT_TYPE
Attrs:
- COMP_TYP_NAM
- COMP_TYP_CODE

Entity: COMP_MATERIAL
Attrs:
- COMP_MATL_NAM
- COMP_MATL_CODE

Entity: COMP_TYP_MATERIAL
Attrs:
- COMP_TYP_MATL_DTE

Entity: DATA_FORM
Attrs:
- FRM_DOC_MGT_CTL_NO
- FRM_TYP
- FRM_NO

Entity: DATA_USE_QUALIFIER
Attrs:
- DATA_USE_QUAL_CODE
- DATA_USE_QUAL_DESC

Entity: DATA_XFER_FILE
Attrs:
- DATA_XFER_FILE_NAM

Entity: DRILLING_EVENT
Attrs:
- DE_COMMENT
- DE_TOT_DEVIAT
- DE_DEVIAT_METH
- DE_AUGR_REFSL_ELEV

```
                DE_GEO_LOG_FLG
                DE_CMPLT_DTE
                DE_EQUP_TYP
                DE_EQUP_MAK
                DE_GEO_CONTCTR
                DE_CONTCTR
                DE_GEOGLST_NAM
                DE_BEG_DTE
Entity:     DRILLING_METHOD
Attrs:          DRILL_METH_DESC
                DRILL_METH_CODE
Entity:     ENV_MON_LOC_FLOW
Attrs:          EMLF_MIN_RATE
                EMLF_MAX_RATE
                EMLF_TIME
                EMLF_RATE
                EMLF_DTE
                EMLF_CONV_MIN_RATE
                EMLF_CONV_MAX_RATE
                EMLF_METH_CODE
                EMLF_CONV_RATE
                EMLF_UNT_ABBR
                EMLF_CONV_UNT_ABBR
Entity:     ENV_PROJECT
Attrs:          EP_COMMENT
                EP_SPON
                EP_OU_ACRONYM
                EP_ADS_NO
                EP_ADS_NAM
                EP_RQMT_SRCE_ID
                EP_NAM
                EP_END_DTE
                EP_BEG_DTE
                EP_ID
                EP_DESC
Entity:     ENV_PROJECT_TASK
Attrs:          ENV_PROJ_TASK_DESC
                ENV_PROJ_TASK_CODE
Entity:     ENV_PROJ_TASK_LOC
Attrs:          ENV_PROJ_TASK_DTE
Entity:     EQUP_CALB_EVENT
Attrs:          EQUP_CALB_COMMENT
                EQUP_CALB_SEQ_NO
                EQUP_CALB_TYP
                EQUP_CALB_TIME
                EQUP_CALB_DTE
Entity:     EQUP_CALB_EVT_FRM
Attrs:          EQUP_CALB_FRM_DTE
Entity:     EQUP_CALB_RESULT
Attrs:          CALB_RSLT_COMMENT
                EQUP_CALB_FLG
                EQUP_CALB_TEMP
                EQUP_CALB_PARAM
                CALB_RSLT_SEQ_NO
                EQUP_CALB_UNIT
                EQUP_CALB_VAL
Entity:     EQUP_INIT_EVT_FRM
Attrs:          EQUP_INIT_FRM_DTE
Entity:     EQUP_INSP_EVENT
Attrs:          EQUP_INSP_COMMENT
                EQUP_INSP_DTE
Entity:     EQUP_INSP_EVT_FRM
Attrs:          EQUP_INSP_FRM_DTE
```

Entity: EQUP_LOC_INIT_EVT
Attrs:
- EL_INIT_COMMENT
- EL_INIT_TIME
- EL_INIT_DTE

Entity: EQUP_LOC_REM_EVENT
Attrs:
- EL_REM_TIME
- EL_REM_COMMENT
- EL_REM_DTE

Entity: EQUP_REM_EVT_FRM
Attrs:
- EQUP_REM_FRM_DTE

Entity: EQUP_REPAIR_EVENT
Attrs:
- EQUP_REPR_EVT_DTE
- EQUP_REPR_RET_DTE
- EQUP_REPR_COMMENT
- EQUP_REPR_SND_DTE

Entity: EXCEPTION_EVENT
Attrs:
- EXCEPT_EVT_DESC
- EXCEPT_EVT_YEAR
- EXCEPT_EVT_NO
- EXCEPT_EVT_SEV_COD
- EXCEPT_EVT_DET_DTE

Entity: EXTERNAL_QC_SAMPLE
Attrs:
- EQCS_EPA_ID
- EQCS_QTY_UNIT
- EQCS_QTY_VAL
- EQCS_ID

Entity: FIELD_COC
Attrs:
- FIELD_COC_DTE

Entity: FIELD_EQUIPMENT
Attrs:
- EQUP_RETIRED_DTE
- EQUP_COMMENT
- EQUP_MFG_NAM
- EQUP_BEG_DTE
- EQUP_MODEL_NO
- EQUP_TYP
- EQUP_STAT_CODE
- EQUP_LAST_CALB_DTE
- EQUP_ID
- EQUP_MFG_SER_NO

Entity: FIELD_MEASUREMENT
Attrs:
- FM_LOG_ID
- FM_LOG_BEG_PGE_NO
- FM_DATA_USE_QUAL
- FM_RSLT_VALID_QUAL
- FM_RSLT_QUAL
- FM_DEPTH_UNIT
- FM_DEPTH
- FM_COMMENT
- FM_DTE_COLL
- FM_TIME_COLL
- FM_RPT_RSLT
- FM_RPT_UNIT
- FM_INIT_FNL_INDCTR
- FM_CONV_RPT_RSLT
- FM_CONV_UNIT
- FM_SEQ_NO
- FM_REVISED_FLG
- FM_METH

Entity: GEOLOGIC_FORMATION
Attrs:
- GEO_FORM_CODE
- GEO_FORM_NAM

Entity: GEOLOGIC_GROUP
Attrs:
- GEO_GRP_NAM

```
            GEO_GRP_CODE
Entity:   GPS_LOCATION
Attrs:      GPSL_ID
            GPSL_ELLPS_STD_ERR
            GPSL_LONG_STD_ERR
            GPSL_LAT_STD_ERR
            GPSL_ELLPS_HGHT
            GPSL_LONGITUDE
            GPSL_LATITUDE
Entity:   HOLE_INTERVAL
Attrs:      HI_ACT_SOIL_RECV
            HI_PLAN_SOIL_RECV
            HI_ASTM_CODE
            HI_DIAM_UNIT
            HI_DIAM
            HI_COMMENT
            HI_END_DPTH
            HI_BEG_DPTH
            HI_VSUAL_DESC
Entity:   HOLE_INTERVAL_CHAR
Attrs:      HOLE_INTV_CHAR_DTE
Entity:   INTERVAL_CHAR_TYPE
Attrs:      INTV_CHAR_TYP_DESC
            INTV_CHAR_TYP_NAM
            INTV_CHAR_TYP_CODE
Entity:   INT_QC_SAMPLE
Attrs:      QC_SMPL_ORIG_CODE
Entity:   INT_QC_SMPL_RQMT
Attrs:      INT_QC_RQMT_DTE
Entity:   KIT
Attrs:      KIT_PREP_DTE
            KIT_ID
Entity:   LAB
Attrs:      LAB_ZIP_CODE
            LAB_STATE
            LAB_CITY
            LAB_STREET
            LAB_NAM
            LAB_CODE
Entity:   LAB_COC
Attrs:      LAB_COC_DTE
Entity:   LAB_CONTACT
Attrs:      LAB_CONT_PHONE
            LAB_CONT_NAM
Entity:   LAB_INSTRUMENT
Attrs:      LAB_INST_TYP
            LAB_INST_ID
Entity:   LAB_INST_CALB_EVT
Attrs:      LAB_INST_LAST_TIME
            LAB_INST_LAST_DTE
            LAB_INST_CALB_CAT
            LAB_INST_CONC_LVL
            LAB_INST_GC_COL
            LAB_INST_GC_COL_ID
            LAB_INST_CALB_FILE
            LAB_INST_CALB_TYP
            LAB_INST_CALB_TIME
            LAB_INST_CALB_DTE
Entity:   LAB_INST_CALB_RSLT
Attrs:      INST_CALB_RSLT_SEQ
            INST_CALB_COMMENT
            INST_CALB_RSLT_TYP
            INST_CALB_RSLT_UNT
```

```
            INST_CALB_RSLT_VAL
Entity:   LAB_TEST
Attrs:      LAB_TST_ID
            LAB_TST_NAM
            LAB_TST_TYP
            LAB_TST_HLD_FLG
            LAB_TST_HLD_QTY
            LAB_TST_HLD_UNIT
Entity:   LAB_TEST_MATRIX
Attrs:      LAB_MATRX_HLD_QTY
            LAB_MATRX_HLD_UNIT
            LAB_MATRX_MIN_UNIT
            LAB_MATRX_MIN_REQD
            LAB_MATRX_DEF_UNIT
Entity:   LAB_TEST_PARAMETER
Attrs:      LTP_EPA_METH
            LTP_SURRGT_FLG
            LTP_HLD_UNIT
            LTP_HLD_QTY
Entity:   LAB_TEST_PARAM_LIM
Attrs:      LAB_TST_DET_LIM
            LAB_TST_LOW_LIM
Entity:   LAB_TEST_QUAL
Attrs:      LAB_TST_QUAL_CODE
            LAB_TST_QUAL_DESC
Entity:   MATRIX_TYPE
Attrs:      MATRX_TYP_USE_CODE
            MATRX_TYP_DESC
            MATRX_TYP_CODE
Entity:   MEASUREMENT_UNIT
Attrs:      MEAS_UNIT_ABBR
            MEAS_UNIT_NAM
Entity:   MEAS_UNIT_CONV_FAC
Attrs:      MUCF_PREF_UNT_ABBR
            MUCF_RPT_UNIT_ABBR
            MUCF_RSLT_VAL
            MUCF_RSLT_VAL_EXP
Entity:   ME_DATA_XFER_FILE
Attrs:      ME_DATA_FILE_DTE
Entity:   MONITORING_EVENT
Attrs:      ME_END_TIME
            ME_END_DTE
            ME_COMMENT
            ME_SEQ_NO
            ME_WEATHER
            ME_BEG_TIME
            ME_BEG_DTE
Entity:   MONITORING_TEAM
Attrs:      MONIT_TEAM_ID
Entity:   MONIT_EVT_DATA_FRM
Attrs:      MONIT_DATA_FRM_DTE
Entity:   MONIT_FREQUENCY
Attrs:      MONIT_FREQ_CODE
            MONIT_FREQ_DESC
Entity:   MONIT_LOCATION
Attrs:      ML_GPS_VAR_CODE
            ML_MARKER_UNIT
            ML_MARKER_NO
            ML_NAM
            ML_STAT_CODE
            ML_MEAS_ERR
            ML_MEAS_METH
            ML_ELEV_MEAS_METH
```

ML_ELEV_MEAS_ERR
ML_NORTHING
ML_EASTING
ML_GND_ELEV
ML_COMMENT
ML_GRID_SYS
ML_DESC
ML_TYP
ML_ID

Entity: MONIT_LOC_ALIAS
Attrs:
MLA_BEG_DTE
MLA_NAM
MLA_ID

Entity: MONIT_LOC_SRVC_PER
Attrs:
MLSP_COMMENT
MLSP_END_DTE
MLSP_BEG_DTE

Entity: PARAMETER
Attrs:
PARAM_CODE
PARAM_ABBR
PARAM_CAS_ID
PARAM_STD_NAM

Entity: PARAM_ANALYSIS_CAT
Attrs:
PARAM_ANLY_CAT_NAM
PARAM_ANLY_CAT_COD

Entity: PARAM_ANALYSIS_GRP
Attrs:
PARAM_ANLY_GRP_NAM
PARAM_ANLY_GRP_COD

Entity: PLUGGING_EVENT
Attrs:
PLUG_EVT_LOC_ID
PLUG_EVT_DTE

Entity: PLUGGING_METHOD
Attrs:
PLUG_METH_NAM
PLUG_METH_DESC

Entity: PLUG_INTV_MATERIAL
Attrs:
PLUG_INTV_END_DPTH
PLUG_INTV_BEG_DPTH

Entity: PLUG_MATERIAL
Attrs:
PLUG_MATL_NAM
PLUG_MATL_CODE

Entity: PRESERVATIVE
Attrs:
PRESERVATIVE_NAM
PRESERVATIVE_CODE

Entity: PT_ANLY_CAT_MATRIX
Attrs:
PT_ANLY_MATRX_DTE

Entity: PURGE_EVENT
Attrs:
PURG_EVT_WTR_DISP
PURG_EVT_SEQ_NO
PURG_EVT_VOL_UNIT
PURG_EVT_PURG_VOL
PURG_EVT_TIME

Entity: PURGE_METHOD
Attrs:
PURG_METH_DESC
PURG_METH_CODE

Entity: QC_ANALYTE
Attrs:
QCA_LOW_QUAL_LIM
QCA_UP_QUAL_LIM
QCA_CONC_UNIT
QCA_CONC_VAL

Entity: QC_MATERIAL
Attrs:
QC_MATL_DESC
QC_MATL_ID

Entity: QC_RESULT

Attrs: QC_RSLT_UNIT
QC_RSLT_VAL
QC_RSLT_DESC
Entity: QC_SMPL_REF_MATL
Attrs: QCS_FNL_QTY_UNIT
QCS_FNL_QTY
QCS_ADD_QTY_UNIT
QCS_ADD_QTY_VAL
Entity: QC_TYPE
Attrs: QCT_INT_EXT_CODE
QCT_NAM
QCT_CODE
Entity. QC_TYPE_COMPONENT
Attrs: QCTC_SIG_DIGIT_QTY
QCTC_DEF_UNIT
QCTC_VAL_FORMAT
QCTC_VAL_LEN
QCTC_VAL_TYP
QCTC_NAM
Entity: REFERENCE_MATERIAL
Attrs: REF_MATL_DESC
REF_MATL_NO
Entity: REF_MATL_ANALYTE
Attrs: RMA_CONC_UNIT
RMA_CONC_VAL
Entity: REGULATORY_METHOD
Attrs: REG_METH_AGENCY
REG_METH_ID
REG_METH_DESC
REG_METH_NAM
Entity: RIVER
Attrs: RIVER_NAM
RIVER_ID
Entity: SAMPLE
Attrs: SMPL_GEN_HIST_ID
SMPL_HIST_ID
SMPL_COMPOSITE_FLG
SMPL_BIOTA_STAT
SMPL_SPECIES
SMPL_PROC_TYP_CODE
SMPL_BANK_CODE
SMPL_SEDIMENT_TYP
SMPL_STAT_CODE
SMPL_INTV_UNIT
SMPL_CERT_LOT_NO
SMPL_COLL_EQUP_SER
SMPL_DTE
SMPL_TIME
SMPL_FLD_LOG_BG_PG
SMPL_END_INTV
SMPL_BEG_INTV
SMPL_ID
SMPL_COMPL_CHK_FLG
SMPL_COMMENT
Entity: SAMPLER_TYPE
Attrs: SMPLR_TYP_DESC
SMPLR_TYP_CODE
Entity: SAMPLE_LAB
Attrs: SMPL_LAB_ID
SMPL_LAB_BATCH_ID
Entity: SAMPLE_PAIR_TYPE
Attrs: SMPL_PAIR_TYP_NAM
SMPL_PAIR_TYP_CODE

Entity: SAMPLE_REF_MATL
Attrs: SMPL_REF_MATL_DTE
Entity: SAMPLE_RESULT
Attrs: SR_SEQ_NO
SR_MISD_HLD_TIM_QL
SR_OUT_CST_LIM_FLG
SR_CNF_LVL_LIM_FLG
SR_CONF_LVL
SR_PREFIX_QUAL
SR_DATA_USE_QUAL
SR_COMMENT
SR_TENTV_ID_COMPND
SR_REV_COMMENT
SR_REV_FLG
SR_DILUTION_FAC
SR_CONV_UNIT
SR_CONV_VAL
SR_RPT_UNIT
SR_RPT_VAL
SR_ID
Entity: SAMPLE_TEST
Attrs: SMPL_TST_COMMENT
SMPL_TST_ASSOC_TYP
SMPL_TST_ASSOC_ID
SMPL_TST_CST
SMPL_TST_LAB_FILE
SMPL_TST_GC_ID
SMPL_TST_GC_COL
SMPL_TST_LVL
SMPL_TST_COMPL_TIM
SMPL_TST_COMPL_DTE
SMPL_TST_BATCH_POS
SMPL_TST_END_QTY
SMPL_TST_QTY_UNIT
SMPL_TST_INIT_QTY
SMPL_TST_BATCH_NO
SMPL_TST_TIME
SMPL_TST_DTE
SMPL_TST_SEQ_NO
Entity: SAMPLE_TYPE
Attrs: SMPL_TYP_NAM
SMPL_TYP_DESC
SMPL_TYP_CODE
Entity: SAMPLE_WASTE_CODE
Attrs: SMPL_WST_CODE_DTE
Entity: SAMPLING_PROCEDURE
Attrs: SMPL_PROCED_REV
SMPL_PROCED_DESC
SMPL_PROCED_NO
Entity: SAP_ELEMENT
Attrs: SAP_ELE_ACT_DTE
SAP_ELE_INACT_DTE
SAP_ELE_DTE
SAP_ELE_ID
Entity: SDG_SHIP_CONTNR
Attrs: SDG_SHIP_ORD_FRM
SDG_TEMP_UNIT
SDG_RCPT_COND
SDG_RCV_TEMP
SDG_SHIP_TEMP
SDG_CONTNR_TYP
SDG_CONTNR_NO
Entity: SMPL_ANLY_PLAN

```
Attrs:      SAP_MONIT_PLAN_ID
            SAP_ACT_DTE
            SAP_ID
Entity:   SMPL_ASSOC_FORM
Attrs:      SMPL_ASSOC_FRM_DTE
Entity:   SMPL_ASSOC_INT_QC
Attrs:      SMPL_ASSOC_QC_DTE
Entity:   SMPL_CONT_TYPE
Attrs:      SMPL_CONT_MIN_VOL
            SMPL_CONT_UNT_ABBR
            SMPL_CONT_MATL_COD
Entity:   SMPL_DELIVERY_GRP
Attrs:      SDG_FIN_RPT_DTE
            SDG_RPT_DUE_DTE
            SDG_EPA_CASE_NO
            SDG_ANLY_REQD_DTE
            SDG_LAB_SHP_DTE
            SDG_LAB_RCD_DTE
            SDG_SHP_CONT_NO
            SDG_NO
Entity:   SMPL_REQUIREMENT
Attrs:      SMPL_RQMT_ID
Entity:   SMPL_RSLT_QUAL
Attrs:      SMPL_RSLT_QUAL_DTE
Entity:   SOW_METHOD
Attrs:      SOW_METH_ID
Entity:   SOW_METH_PARAM
Attrs:      SOW_METH_PARAM_DTE
Entity:   STATEMENT_OF_WORK
Attrs:      SOW_MAX_SMPL
            SOW_FUND_AMT
            SOW_PURCH_REQ_NO
            SOW_CHARGE_NO
            SOW_APO_NO
            SOW_NO
Entity:   TEAM_MEMBER_ROLE
Attrs:      TEAM_MEM_ROLE_DTE
Entity:   TEAM_ROLE
Attrs:      TEAM_ROLE_NAM
            TEAM_ROLE_CODE
Entity:   TEST_PARAM_QC_LIM
Attrs:      TPQC_CRI_UNIT
            TPQC_LOW_LIM_VAL
            TPQC_UP_LIM_VAL
Entity:   USGS_WEIR_FLOW
Attrs:      WEIR_STD_FLOW_VAL
            WEIR_FLOW_HGT_VAL
            WEIR_FLOW_REC_DTE
            WEIR_FLOW_REC_TIME
            WEIR_FLOW_VERF_FLG
            WEIR_FLOW_BADGE_NO
Entity:   VALID_RSLT_QUAL
Attrs:      VLD_RSLT_QUAL_TYP
            VLD_RSLT_QUAL
            VLS_RSLT_QUAL_DESC
Entity:   WASTE_CODE
Attrs:      WASTE_CODE_ID
            WASTE_CODE_DESC
Entity:   WELL
Attrs:      WELL_USE
            WELL_TRNSMSVTY
            WELL_PERMIT_NO
            WELL_ROCK_DPTH
```

```
                WELL_INIT_WTR_DPTH
                WELL_TYP
                WELL_COMMENT
                WELL_GROUT
                WELL_CONSTR_DPTH
                WELL_GEO_UNIT
                WELL_UPRGT_MNT_FLG
                WELL_AQUIFIER
Entity:     WELL_COMPONENT
Attrs:          WELL_COMP_EVT_ID
                WELL_COMP_TOP_DPTH
                WELL_COMP_BOT_DPTH
                WELL_COMP_INS_DIAM
                WELL_COMP_OUT_DIAM
                WELL_COMP_SLOT_SIZ
                WELL_COMP_MFG_NAM
                WELL_COMP_REM_DTE
Entity:     WELL_DEV_EVENT
Attrs:          WELL_DEV_COMMENT
                WELL_DEV_METH
                WELL_DEV_END_DTE
Entity:     WELL_INSTALL_EVENT
Attrs:          WI_MEAS_ELEV
                WI_EQUP_LOG_FLG
                WI_COMMENT
                WI_DEV_LOG_FLG
                WI_COMPL_DTE
                WI_CONST_CONTCTR
Entity:     WELL_MOD_EVENT
Attrs:          WELL_MOD_ACT
                WELL_MOD_COMPL_DTE
                WELL_MOD_TYP
                WELL_MOD_COMMENT
                WELL_MOD_MEAS_ELEV
Entity:     IEF_SUPPLIED
Attrs:          ACTION_ENTRY
                COMMAND
                COUNT
                TOTAL_REAL
                TOTAL_CURRENCY
                TOTAL_INTEGER
                PERCENTAGE
                AVERAGE_REAL
                AVERAGE_CURRENCY
                AVERAGE_INTEGER
                FLAG
                SUBSCRIPT

                    -End of Report-
```

Appendix C

ENTITY DEFINITION REPORT

Appendix C contains the entity definition report. It contains an alphabetic list of entities along with their definition, the subject area to which they belong, their properties, the attributes contained within them, their relationships to other entities, and their identifiers.

Entity Definition

Model : WAG6
Subset: (complete model)
Nov. 17, 1993 09:20

Entity: ACTION_LIMIT

Description: A regulatory restriction or maximum contaminent level that specifies the minimum and maximum concentration level acceptable for a PARAMETER for a specific (monthly) time period. There are three types of limits: Physical, Historical, and Regulatory. Historical limits are non-location specific. This kind of limit does not cause an exception. Regulatory limits are derived from a higher source (e.g. RCRA,CERCLA, etc.) Physical Limits are Parameter and location specific.

Subject area: LABORATORY_TESTS

Properties:
Min Occ: 0 Avg Occ: 0
Max Occ: 3000 Growth Rate: 0% per year

Attributes:
ACT_LIM_CLOSED_DTE
ACT_LIM_EFFECT_DTE
ACT_LIM_UNIT
ACT_LIM_VAL

Relationships:
Always HAS_SPECIFIED one PARAMETER
cannot transfer.
Always HAS_SPECIFIED one MATRIX_TYPE
cannot transfer.
Always HAS_SPECIFIED one ENV_PROJECT_TASK
cannot transfer.

Identifiers:
<unnamed> (Primary)
HAS_SPECIFIED PARAMETER
HAS_SPECIFIED MATRIX_TYPE
HAS_SPECIFIED ENV_PROJECT_TASK

Entity: AREA_GROUP

Description: A collection of measuring point stations (typically wells) grouped by geographic areas for a specific purpose. These groups can be designated as Waste Area Groups, Sites, Operable Units, etc.

Subject area: MONITORING_LOCATIONS

Properties:
Min Occ: 0 Avg Occ: 0
Max Occ: 20 Growth Rate: 0% per year

Attributes:
AREA_GRP_NAM
AREA_GRP_TYP
AREA_GRP_DESC
AREA_GRP_ID

Relationships:
Sometimes (0%) IS_A_GROUP_OF many AREA_GRP_LOCATION

```
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.

Identifiers:
     <unnamed>
       AREA_GRP_ID



Entity:         AREA_GRP_LOCATION

Description:    Associates an AREA GROUP with a MONITORING LOCATION.

Subject area:   MONITORING_LOCATIONS

Properties:     Min Occ:          0 Avg Occ:          0
                Max Occ:         20 Growth Rate:      0% per year

Attributes:     AG_LOC_BEG_DTE
                AG_LOC_END_DTE
                AG_LOC_PURG_SEQ
Relationships:
Always IS_A_GROUP_OF one MONIT_LOCATION
    cannot transfer.
Always IS_GROUPED_BY one AREA_GROUP
    cannot transfer.

Identifiers:
     <unnamed>  (Primary)
       IS_A_GROUP_OF MONIT_LOCATION
       IS_GROUPED_BY AREA_GROUP



Entity:         BADGED_PERSON

Description:    Any person who has a badge that might be serving on a
                sampling team.

Subject area:   MONITORING_TEAMS

Properties:     Min Occ:          0 Avg Occ:          0
                Max Occ:          0 Growth Rate:      0% per year

Attributes:     BDGD_PRSN_UID
                BDGD_PRSN_LAST_NAM
                BDGD_PRSN_MID_NAM
                BDGD_PRSN_FRST_NAM
                BDGD_PRSN_BADGE_NO
Relationships:
Sometimes (0%) ENTERS_INTO_INVENTORY many FIELD_EQUIPMENT
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) BELONGS_TO many TEAM_MEMBER_ROLE
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) PERFORMS many EQUP_CALB_EVENT
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) PERFORMS many EQUP_INSP_EVENT
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
```

cannot transfer.
Sometimes (0%) PERFORMS many EQUP_LOC_INIT_EVT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) PERFORMS many EQUP_LOC_REM_EVENT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) PERFORMS many EQUP_REPAIR_EVENT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed> (Primary)
BDGD_PRSN_BADGE_NO

Entity: BORE_HOLE

Description: A hole drilled into the subsurface from which subsurface materials such as soil and rock samples may be obtained or in which a monitoring well or piezometer may be installed. Includes characteristics about the borehole (i.e., depth, diameter, description, etc.)

Subject area: BOREHOLES

Properties:

Min Occ:	0	Avg Occ:	0
Max Occ:	0	Growth Rate:	0% per year

Attributes:
BH_PERMIT_NO
BH_ROCK_CORE_DESC
BH_DRAW_NO
BH_RPT_NO
BH_RPT_TITLE
BH_RPT_DRAW_DTE
BH_COMMENT
BH_CONV_WELL_FLG
BH_DPTH
BH_ROCK_DPTH
BH_INIT_WTR_DPTH
BH_DIAM_UNIT
BH_DIAM

Relationships:
Always IS_A_TYPE_OF one MONIT_LOCATION
cannot transfer.
Sometimes (0%) IS_PERMANENTLY_CLOSED_DURING one PLUGGING_EVENT
cannot transfer.
Always IS_LOCATED_IN one GEOLOGIC_FORMATION
cannot transfer.

Identifiers:
<unnamed> (Primary)
IS_A_TYPE_OF MONIT_LOCATION

Entity: COMPANY

Description: The company that a member of a MONITORING TEAM works

for.

Subject area: MONITORING_TEAMS

Properties:
Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes:
CO_NAM
CO_CODE

Relationships:
Sometimes (0%) OWNS many FIELD_EQUIPMENT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) EMPLOYS many TEAM_MEMBER_ROLE
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed> (Primary)
CO_CODE

Entity: COMPONENT_TYPE

Description: A particular part or section of a WELL. Examples include: screen, well casing, filter, protective casing, or surface casing.

Subject area: WELLS

Properties:
Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes:
COMP_TYP_NAM
COMP_TYP_CODE

Relationships:
Sometimes (0%) HAS many COMP_TYP_MATERIAL
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed> (Primary)
COMP_TYP_CODE

Entity: COMP_MATERIAL

Description: The material used to construct a component of a well, such as the protective case, the well casing, or the screen.

Subject area: WELLS

Properties:
Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes:
COMP_MATL_NAM
COMP_MATL_CODE

Relationships:

Sometimes (0%) USED_BY many COMP_TYP_MATERIAL
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed> (Primary)
COMP_MATL_CODE

Entity: COMP_TYP_MATERIAL

Description: An occurrence of a particular COMPONENT TYPE developed using a particular COMPONENT MATERIAL.

Subject area: WELLS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: COMP_TYP_MATL_DTE
Relationships:
Always USES one COMP_MATERIAL
cannot transfer.
Always IS_AN_INSTANCE_OF one COMPONENT_TYPE
cannot transfer.
Sometimes (0%) INSTALLED_AS many WELL_COMPONENT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed> (Primary)
USES COMP_MATERIAL
IS_AN_INSTANCE_OF COMPONENT_TYPE

Entity: DATA_FORM

Description: Any form used to record information about a SAMPLE, MONITORING EVENT, EQUIPMENT CALIBRATION EVENT, EQUIP LOC INIT EVENT, EQUIP INSPECT EVENT, or EQUIP REPAIR EVENT. Examples include the Sample Initiation Form, Sample Collection Form, Sample Processing Information Form, Field Logbook, etc.

Subject area: SAMPLES

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 5000 Growth Rate: 0% per year

Attributes: FRM_DOC_MGT_CTL_NO
FRM_TYP
FRM_NO
Relationships:
Sometimes (0%) CONTAINS_INFO_ABOUT many SMPL_ASSOC_FORM
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) CONTAINS_INFO_ABOUT many MONIT_EVT_DATA_FRM
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1

```
    cannot transfer.
Sometimes (0%) CONTAINS_INFO_ABOUT many EQUP_REPAIR_EVENT
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) CONTAINS_INFO_ABOUT many EQUP_INSP_EVT_FRM
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) CONTAINS_INFO_ABOUT many EQUP_INIT_EVT_FRM
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) CONTAINS_INFO_ABOUT many EQUP_CALB_EVT_FRM
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) MAY_BE one FIELD_COC
    cannot transfer.
Sometimes (0%) MAY_BE one LAB_COC
    cannot transfer.
Sometimes (0%) CONTAINS_INFO_ABOUT many EQUP_REM_EVT_FRM
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.

Identifiers:
     <unnamed>  (Primary)
       FRM_NO
       FRM_TYP
```

```
Entity:          DATA_USE_QUALIFIER

Description:     A set of predefined alphabetic or numeric codes applied
                 to analytical data to signify their usability.

Subject area:    SAMPLE_RESULTS

Properties:      Min Occ:          0 Avg Occ:          0
                 Max Occ:         10 Growth Rate:      0% per year

Attributes:      DATA_USE_QUAL_CODE
                 DATA_USE_QUAL_DESC
Relationships:
Sometimes (0%) IS_ASSIGNED_TO many SAMPLE_RESULT
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.

Identifiers:
     <unnamed>
       DATA_USE_QUAL_CODE
```

```
Entity:          DATA_XFER_FILE

Description:     This entity contains the file name used to download
                 data from the electronic collection devices into the
                 database.

Subject area:    MONITORING_EVENTS

Properties:      Min Occ:          0 Avg Occ:          0
                 Max Occ:          0 Growth Rate:      0% per year
```

Attributes: DATA_XFER_FILE_NAM
Relationships:
Always CONTAINS_DATA_PERTAINING_TO many ME_DATA_XFER_FILE
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed> (Primary)
DATA_XFER_FILE_NAM

Entity: DRILLING_EVENT

Description: An occurrence of a drilling activity performed to collect cuttings beneath the surface prior to the construction of a well and/or for characterization purposes.

Subject area: BOREHOLES

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: DE_COMMENT
DE_TOT_DEVIAT
DE_DEVIAT_METH
DE_AUGR_REFSL_ELEV
DE_GEO_LOG_FLG
DE_CMPLT_DTE
DE_EQUP_TYP
DE_EQUP_MAK
DE_GEO_CONTCTR
DE_CONTCTR
DE_GEOGLST_NAM
DE_BEG_DTE

Relationships:
Always IS_A_TYPE_OF one MONITORING_EVENT
cannot transfer.
Sometimes (0%) CREATES many HOLE_INTERVAL
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) REQUIRED_FOR one WELL_INSTALL_EVENT
cannot transfer.

Identifiers:
<unnamed> (Primary)
IS_A_TYPE_OF MONITORING_EVENT

Entity: DRILLING_METHOD

Description: A process used to drill a hole into soil or bedrock and extract the material from the hole.

Subject area: BOREHOLES

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: DRILL_METH_DESC
DRILL_METH_CODE
Relationships:
Sometimes (0%) USED_TO_DRILL many HOLE_INTERVAL
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed> (Primary)
DRILL_METH_CODE

Entity: ENV_MON_LOC_FLOW

Description: FULL NAME: ENVIRONMENTAL MONITORING LOCATION FLOW RATE

The rate of water velocity measured or calculated at an ENVIRONMENTAL MONITORING LOCATION for a specified period of time.

SOURCE: EMMIS Project

Subject area: MONITORING_LOCATIONS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: EMLF_MIN_RATE
EMLF_MAX_RATE
EMLF_TIME
EMLF_RATE
EMLF_DTE
EMLF_CONV_MIN_RATE
EMLF_CONV_MAX_RATE
EMLF_METH_CODE
EMLF_CONV_RATE
EMLF_UNT_ABBR
EMLF_CONV_UNT_ABBR
Relationships:
Always IS_MEASURED_FOR one MONIT_LOCATION
cannot transfer.

Identifiers:
<unnamed> (Primary)
EMLF_DTE
EMLF_TIME
IS_MEASURED_FOR MONIT_LOCATION

Entity: ENV_PROJECT

Description: A project enacted by Environmental Management personnel upon determination that monitoring is needed. A project is represented by a unique project identifier.

Subject area: ENVIRONMENTAL_PROJECTS

Properties: Min Occ: 0 Avg Occ: 0

```
                Max Occ:          1 Growth Rate:      0% per year

Attributes:     EP_COMMENT
                EP_SPON
                EP_OU_ACRONYM
                EP_ADS_NO
                EP_ADS_NAM
                EP_RQMT_SRCE_ID
                EP_NAM
                EP_END_DTE
                EP_BEG_DTE
                EP_ID
                EP_DESC
Relationships:
Sometimes (0%) GROUPS many ENV_PROJECT_TASK
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Always HAS many SMPL_ANLY_PLAN
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.

Identifiers:
     <unnamed>
       EP_ID



Entity:         ENV_PROJECT_TASK

Description:    A particular task which supports an ENVIRONMENTAL
                PROJECT.

Subject area:   ENVIRONMENTAL_PROJECTS

Properties:     Min Occ:          0 Avg Occ:          0
                Max Occ:         20 Growth Rate:      0% per year

Attributes:     ENV_PROJ_TASK_DESC
                ENV_PROJ_TASK_CODE
Relationships:
Sometimes (0%) HAS_SAMPLES_COLLECTED_FOR many PT_ANLY_CAT_MATRIX
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) GROUPS many ENV_PROJ_TASK_LOC
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Always IS_GROUPED_BY one ENV_PROJECT
    cannot transfer.
Sometimes (0%) IS_SPECIFIED_FOR many ACTION_LIMIT
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) HAS_WRITTEN_FOR_IT many STATEMENT_OF_WORK
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) HAS many LAB_CONTACT
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.

Identifiers:
     <unnamed>  (Primary)
       ENV_PROJ_TASK_CODE
       IS_GROUPED_BY ENV_PROJECT
```

Entity: ENV_PROJ_TASK_LOC

Description: A particular MONITORING LOCATION where a ENV PROJECT TASK is performed.

Subject area: MONITORING_LOCATIONS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: ENV_PROJ_TASK_DTE
Relationships:
Sometimes (0%) IS_THE_LOCATION_FOR many MONITORING_EVENT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Always GROUPS one MONIT_LOCATION
cannot transfer.
Always IS_GROUPED_BY one ENV_PROJECT_TASK
cannot transfer.

Identifiers:
<unnamed> (Primary)
GROUPS MONIT_LOCATION
IS_GROUPED_BY ENV_PROJECT_TASK

Entity: EQUP_CALB_EVENT

Description: The occurence of a monitoring instrument tuning/adjustment prior to it being used to collect or record a field measurement.

Subject area: FLD_EQUIPMENT

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 500 Growth Rate: 0% per year

Attributes: EQUP_CALB_COMMENT
EQUP_CALB_SEQ_NO
EQUP_CALB_TYP
EQUP_CALB_TIME
EQUP_CALB_DTE
Relationships:
Always VERIFIES_ACCURACY_OF one FIELD_EQUIPMENT
cannot transfer.
Sometimes (0%) HAS_RECORDED many EQUP_CALB_RESULT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) HAS_INFO_RECORDED_BY many EQUP_CALB_EVT_FRM
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Always IS_PERFORMED_BY one BADGED_PERSON
cannot transfer.

Identifiers:
<unnamed> (Primary)
EQUP_CALB_DTE

EQUP_CALB_SEQ_NO
VERIFIES_ACCURACY_OF FIELD_EQUIPMENT

Entity: EQUP_CALB_EVT_FRM

Description: This shows all DATA FORMs that contain information about the EQUIP CALIBRATION EVENT.

Subject area: FLD_EQUIPMENT

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: EQUP_CALB_FRM_DTE
Relationships:
Always HAS_INFO_RECORDED_BY one DATA_FORM
cannot transfer.
Always CONTAINS_INFO_ABOUT one EQUP_CALB_EVENT
cannot transfer.

Identifiers:
<unnamed> (Primary)
HAS_INFO_RECORDED_BY DATA_FORM
CONTAINS_INFO_ABOUT EQUP_CALB_EVENT

Entity: EQUP_CALB_RESULT

Description: The resulting graduation interval of a piece of equipment that was calibrated.

Subject area: FLD_EQUIPMENT

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 7500 Growth Rate: 0% per year

Attributes: CALB_RSLT_COMMENT
EQUP_CALB_FLG
EQUP_CALB_TEMP
EQUP_CALB_PARAM
CALB_RSLT_SEQ_NO
EQUP_CALB_UNIT
EQUP_CALB_VAL
Relationships:
Always IS_RECORDED_DURING one EQUP_CALB_EVENT
cannot transfer.

Identifiers:
<unnamed> (Primary)
CALB_RSLT_SEQ_NO
EQUP_CALB_PARAM
IS_RECORDED_DURING EQUP_CALB_EVENT

Entity: EQUP_INIT_EVT_FRM

Description: This shows all DATA FORMs that contain information about the EQUIP LOC INIT EVENT.

Subject area: FLD_EQUIPMENT

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: EQUP_INIT_FRM_DTE
Relationships:
Always HAS_INFO_RECORDED_BY one DATA_FORM
cannot transfer.
Always CONTAINS_INFO_ABOUT one EQUP_LOC_INIT_EVT
cannot transfer.

Identifiers:
<unnamed> (Primary)
HAS_INFO_RECORDED_BY DATA_FORM
CONTAINS_INFO_ABOUT EQUP_LOC_INIT_EVT

Entity: EQUP_INSP_EVENT

Description: The occurrence of the inspection of a piece of FIELD EQUIPMENT.

Subject area: FLD_EQUIPMENT

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: EQUP_INSP_COMMENT
EQUP_INSP_DTE
Relationships:
Always IS_THE_INSPECTION_OF one FIELD_EQUIPMENT
cannot transfer.
Sometimes (0%) HAS_INFO_RECORDED_BY many EQUP_INSP_EVT_FRM
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Always IS_PERFORMED_BY one BADGED_PERSON
cannot transfer.

Identifiers:
<unnamed> (Primary)
EQUP_INSP_DTE
IS_THE_INSPECTION_OF FIELD_EQUIPMENT

Entity: EQUP_INSP_EVT_FRM

Description: This shows all DATA FORMs that contain information about the EQUIP INSPECTION EVENT.

Subject area: FLD_EQUIPMENT

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: EQUP_INSP_FRM_DTE

Relationships:
Always HAS_INFO_RECORDED_BY one DATA_FORM
    cannot transfer.
Always CONTAINS_INFO_ABOUT one EQUP_INSP_EVENT
    cannot transfer.

Identifiers:
     <unnamed> (Primary)
       HAS_INFO_RECORDED_BY DATA_FORM
       CONTAINS_INFO_ABOUT EQUP_INSP_EVENT

Entity: EQUP_LOC_INIT_EVT

Description: The occurrence of initializing a piece of FIELD EQUIPMENT at a MONITORING LOCATION.

Subject area: FLD_EQUIPMENT

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: EL_INIT_COMMENT
EL_INIT_TIME
EL_INIT_DTE

Relationships:
Always HAS_ASSIGNED_TO_IT one FIELD_EQUIPMENT
    cannot transfer.
Always IS_ASSIGNED_TO one MONIT_LOCATION
    cannot transfer.
Sometimes (0%) HAS_INFO_RECORDED_BY many EQUP_INIT_EVT_FRM
    Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) HAS_EQUIPMENT_REMOVED_BY one EQUP_LOC_REM_EVENT
    cannot transfer.
Always IS_PERFORMED_BY one BADGED_PERSON
    cannot transfer.

Identifiers:
     <unnamed> (Primary)
       EL_INIT_DTE
       HAS_ASSIGNED_TO_IT FIELD_EQUIPMENT
       IS_ASSIGNED_TO MONIT_LOCATION

Entity: EQUP_LOC_REM_EVENT

Description: The occurrence of removing a piece of FIELD EQUIPMENT from a MONIT LOCATION.

Subject area: FLD_EQUIPMENT

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: EL_REM_TIME
EL_REM_COMMENT
EL_REM_DTE

Relationships:

```
Always REMOVES_EQUIPMENT_FROM one EQUP_LOC_INIT_EVT
    cannot transfer.
Sometimes (0%) HAS_INFO_RECORDED_BY many EQUP_REM_EVT_FRM
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Always IS_PERFORMED_BY one BADGED_PERSON
    cannot transfer.

Identifiers:
     <unnamed>  (Primary)
       EL_REM_DTE
       REMOVES_EQUIPMENT_FROM EQUP_LOC_INIT_EVT
```

```
Entity:          EQUP_REM_EVT_FRM

Description:     This shows all DATA FORMs that contain information
                 about the EQUP LOC REM EVENT.

Subject area:    FLD_EQUIPMENT

Properties:      Min Occ:          0 Avg Occ:          0
                 Max Occ:          0 Growth Rate:      0% per year

Attributes:      EQUP_REM_FRM_DTE
Relationships:
Always HAS_INFO_RECORDED_BY one DATA_FORM
    cannot transfer.
Always CONTAINS_INFO_ABOUT one EQUP_LOC_REM_EVENT
    cannot transfer.

Identifiers:
     <unnamed>  (Primary)
       HAS_INFO_RECORDED_BY DATA_FORM
       CONTAINS_INFO_ABOUT EQUP_LOC_REM_EVENT
```

```
Entity:          EQUP_REPAIR_EVENT

Description:     The occurrence of repairing a piece of FIELD EQUIPMENT.

Subject area:    FLD_EQUIPMENT

Properties:      Min Occ:          0 Avg Occ:          0
                 Max Occ:          0 Growth Rate:      0% per year

Attributes:      EQUP_REPR_EVT_DTE
                 EQUP_REPR_RET_DTE
                 EQUP_REPR_COMMENT
                 EQUP_REPR_SND_DTE
Relationships:
Always IS_THE_REPAIR_OF one FIELD_EQUIPMENT
    cannot transfer.
Always HAS_INFO_RECORDED_BY one DATA_FORM
    cannot transfer.
Always IS_PERFORMED_BY one BADGED_PERSON
    cannot transfer.

Identifiers:
```

<unnamed> (Primary)
EQUP_REPR_EVT_DTE
IS_THE_REPAIR_OF FIELD_EQUIPMENT

Entity: EXCEPTION_EVENT

Description: An occurence in which a SAP ELEMENT is not met, for example, because the detected level of a PARAMETER exceeded a specific limit, an error occurred during sampling, or some other condition defined by a permit or internal requirement was in error.
Some EXCEPTIONS can be detected by the system, others must be entered manually. Examples of system detected EXCEPTIONS include: Missed Holding Times, incorrect Sampling Procedure, Measurement Method, Preservative, or Bottle Type. Examples of EXCEPTIONS that will be recorded manually include: Sample Broken, COC Broken, Dry Well, Too Little Sample.

Subject area: MONITORING_EVENTS

Properties:
Min Occ: 0 Avg Occ: 0
Max Occ: 5000 Growth Rate: 0% per year

Attributes:
EXCEPT_EVT_DESC
EXCEPT_EVT_YEAR
EXCEPT_EVT_NO
EXCEPT_EVT_SEV_COD
EXCEPT_EVT_DET_DTE

Relationships:
Sometimes (0%) IS_TRIGGERED_BY one SAMPLE
cannot transfer.
Sometimes (0%) IS_TRIGGERED_BY one SAP_ELEMENT
cannot transfer.
Sometimes (0%) IS_TRIGGERED_BY one FIELD_MEASUREMENT
cannot transfer.
Sometimes (0%) IS_TRIGGERED_BY one SAMPLE_RESULT
cannot transfer.

Identifiers:
<unnamed> (Primary)
EXCEPT_EVT_NO
EXCEPT_EVT_YEAR

Entity: EXTERNAL_QC_SAMPLE

Description: A sample required for verifying the integrity of a sample's measured value. Uses include:
- detection of contaminants during analysis or transportation
- variations between analysis
- verification of analyzer control curve
- verification of continued analyzer control
- variation in sampling technique

Subject area: SAMPLES

```
Properties:     Min Occ:          0 Avg Occ:          0
                Max Occ:          0 Growth Rate:      0% per year

Attributes:     EQCS_EPA_ID
                EQCS_QTY_UNIT
                EQCS_QTY_VAL
                EQCS_ID
Relationships:
Sometimes (0%) IS_SPECIFIED_QC_SAMPLE_FOR many QC_SMPL_REF_MATL
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) HAS_AS_A_MATRX_SPIKE_DUP one EXTERNAL_QC_SAMPLE
    cannot transfer.
Sometimes (0%) IS_A_MATRX_SPIKE_DUPLICATE_OF one EXTERNAL_QC_SAMPLE
    cannot transfer.
Always IS_AN_INSTANCE_OF one QC_TYPE
    cannot transfer.
Sometimes (0%) HAS_REQUESTED_FOR_IT many SAMPLE_TEST
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Always INITIATED_BY one LAB
    cannot transfer.
Always HAS_AS_A_CHARACTERISTIC one MATRIX_TYPE
    cannot transfer.
Sometimes (0%) IS_MADE_FROM one SAMPLE
    cannot transfer.

Identifiers:
     QCSMPL01  (Primary)
       EQCS_ID
       INITIATED_BY LAB



Entity:         FIELD_COC

Description:    The FIELD_CHAIN_OF_CUSTODY is used to document the
                SAMPLEs collected.  It accompanies the team to the
                field and remains with the SAMPLEs until a SAMPLE is
                transferred to another COC.

Subject area:   SAMPLES

Properties:     Min Occ:          0 Avg Occ:          0
                Max Occ:          0 Growth Rate:      0% per year

Attributes:     FIELD_COC_DTE
Relationships:
Always TRACKS many SAMPLE
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Always IS_A_TYPE_OF one DATA_FORM
    cannot transfer.

Identifiers:
     <unnamed>  (Primary)
       IS_A_TYPE_OF DATA_FORM



Entity:         FIELD_EQUIPMENT
```

Description: Equipment used in the field.

Subject area: FLD_EQUIPMENT

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 100 Growth Rate: 0% per year

Attributes: EQUP_RETIRED_DTE
EQUP_COMMENT
EQUP_MFG_NAM
EQUP_BEG_DTE
EQUP_MODEL_NO
EQUP_TYP
EQUP_STAT_CODE
EQUP_LAST_CALB_DTE
EQUP_ID
EQUP_MFG_SER_NO

Relationships:
Always IS_ENTERED_INTO_INVENTORY_BY one BADGED_PERSON
cannot transfer.
Always IS_OWNED_BY one COMPANY
cannot transfer.
Sometimes (0%) HAS_ACCURACY_VERIFIED_VIA many EQUP_CALB_EVENT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) IS_USED_TO_RECORD many FIELD_MEASUREMENT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) IS_INSPECTED_DURING many EQUP_INSP_EVENT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) IS_ASSIGNED_TO many EQUP_LOC_INIT_EVT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) IS_REPAIRED_DURING many EQUP_REPAIR_EVENT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed>
EQUP_ID

Entity: FIELD_MEASUREMENT

Description: The detected level of a PARAMETER as measured at the point of sample collection or observed in the field.

NOTE: This includes the water depth to bottom measurement.

Subject area: MONITORING_EVENTS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 100000 Growth Rate: 0% per year

Attributes: FM_LOG_ID
FM_LOG_BEG_PGE_NO
FM_DATA_USE_QUAL
FM_RSLT_VALID_QUAL

FM_RSLT_QUAL
FM_DEPTH_UNIT
FM_DEPTH
FM_COMMENT
FM_DTE_COLL
FM_TIME_COLL
FM_RPT_RSLT
FM_RPT_UNIT
FM_INIT_FNL_INDCTR
FM_CONV_RPT_RSLT
FM_CONV_UNIT
FM_SEQ_NO
FM_REVISED_FLG
FM_METH

Relationships:
Sometimes (0%) TRIGGERS many EXCEPTION_EVENT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Always IS_QUANTIFIED_BY one PARAMETER
cannot transfer.
Always IS_RECORDED_BY one FIELD_EQUIPMENT
cannot transfer.
Always IS_TAKEN_DURING one MONITORING_EVENT
cannot transfer.

Identifiers:
<unnamed> (Primary)
FM_SEQ_NO
FM_DTE_COLL
IS_QUANTIFIED_BY PARAMETER
IS_TAKEN_DURING MONITORING_EVENT

Entity: GEOLOGIC_FORMATION

Description: A body of rock with common chemical, mineralogic, textural, or other lithologic characteristics. The name is a regionally accepted name for a mappable unit.

Subject area: WELLS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: GEO_FORM_CODE
GEO_FORM_NAM

Relationships:
Sometimes (0%) IS_PART_OF one GEOLOGIC_GROUP
cannot transfer.
Sometimes (0%) LOCATES many WELL
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) LOCATES many BORE_HOLE
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed> (Primary)
GEO_FORM_CODE

Entity: GEOLOGIC_GROUP

Description: A water bearing stratum of permeable rock, sand, or gravel from which the well water flows.

Examples are: Knox, Conasauga, Rome, Chickamauga. It consists partially or entirely of named formations.

Subject area: WELLS

Properties:

Min Occ:	0	Avg Occ:	0
Max Occ:	0	Growth Rate:	0% per year

Attributes:
GEO_GRP_NAM
GEO_GRP_CODE

Relationships:
Always CONSISTS_OF many GEOLOGIC_FORMATION
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed>
GEO_GRP_CODE

Entity: GPS_LOCATION

Description: This entity contains the GPS data associated with either a MONITORING LOCATION or a MONITORING EVENT. There are two relationships: one to MONITORING LOCATION and one to MONITORING EVENT. Both are shown as optional; however, one or the other is mandatory. The GPS data must be associated with one or the other. If the GPS Variation Code on MONITORING LOCATION is equal to "F", then the GPS data will be associated with the MONITORING LOCATION. If the GPS Variation Code is equal to "V", then the GPS data will be associated with the MONITORING EVENT.

Subject area: MONITORING_LOCATIONS

Properties:

Min Occ:	0	Avg Occ:	0
Max Occ:	0	Growth Rate:	0% per year

Attributes:
GPSL_ID
GPSL_ELLPS_STD_ERR
GPSL_LONG_STD_ERR
GPSL_LAT_STD_ERR
GPSL_ELLPS_HGHT
GPSL_LONGITUDE
GPSL_LATITUDE

Relationships:
Sometimes (0%) DEFINES_COORDINATES_FOR one MONIT_LOCATION
cannot transfer.
Sometimes (0%) DEFINES_COORDINATES_FOR one MONITORING_EVENT
cannot transfer.

Identifiers:

<unnamed> (Primary)
GPSL_ID

Entity: HOLE_INTERVAL

Description: The location below ground surface where soil or rock was taken.

Subject area: BOREHOLES

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: HI_ACT_SOIL_RECV
HI_PLAN_SOIL_RECV
HI_ASTM_CODE
HI_DIAM_UNIT
HI_DIAM
HI_COMMENT
HI_END_DPTH
HI_BEG_DPTH
HI_VSUAL_DESC

Relationships:
Always CONTENTS_ARE_DESCRIBED_BY many HOLE_INTERVAL_CHAR
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Always DRILLED_BY one DRILLING_METHOD
cannot transfer.
Always IS_CREATED_DURING one DRILLING_EVENT
cannot transfer.

Identifiers:
<unnamed> (Primary)
HI_BEG_DPTH
IS_CREATED_DURING DRILLING_EVENT

Entity: HOLE_INTERVAL_CHAR

Description: A type of material (soil, rock, sand) that is found below the surface of the ground.

Subject area: BOREHOLES

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: HOLE_INTV_CHAR_DTE
Relationships:
Always DESCRIBES_THE_CONTENTS_OF one HOLE_INTERVAL
cannot transfer.
Always IS_CLASSIFIED_BY one INTERVAL_CHAR_TYPE
cannot transfer.

Identifiers:
<unnamed> (Primary)
DESCRIBES_THE_CONTENTS_OF HOLE_INTERVAL
IS_CLASSIFIED_BY INTERVAL_CHAR_TYPE

Entity: INTERVAL_CHAR_TYPE

Description: Information is captured about a material found in a cutting that was removed from underground. This includes the name, a description, and the associated code for the material.

Subject area: BOREHOLES

Properties:
Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes:
INTV_CHAR_TYP_DESC
INTV_CHAR_TYP_NAM
INTV_CHAR_TYP_CODE

Relationships:
Sometimes (0%) CLASSIFIES many HOLE_INTERVAL_CHAR
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed> (Primary)
INTV_CHAR_TYP_CODE

Entity: INT_QC_SAMPLE

Description: A SAMPLE that is collected and/or submitted to the laboratory in order to test the reliability of the sampling and analysis process.

Subject area: SAMPLES

Properties:
Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes:
QC_SMPL_ORIG_CODE

Relationships:
Sometimes (0%) SATISFIES many INT_QC_SMPL_RQMT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Always IS one SAMPLE
cannot transfer.
Sometimes (0%) IS_CATEGORIZED_AS one QC_TYPE
cannot transfer.
Sometimes (0%) IS_COMPOSED_OF one QC_MATERIAL
cannot transfer.
Sometimes (0%) APPLIES_TO many SMPL_ASSOC_INT_QC
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed> (Primary)
IS SAMPLE

Entity: INT_QC_SMPL_RQMT

Description: The INT_QC_SAMPLEs which satisfy a SMPL REQUIREMENT.

Subject area: SAMPLES

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: INT_QC_RQMT_DTE
Relationships:
Always SATISFIES one SMPL_REQUIREMENT
cannot transfer.
Always IS_SATISFIED_BY one INT_QC_SAMPLE
cannot transfer.

Identifiers:
<unnamed> (Primary)
IS_SATISFIED_BY INT_QC_SAMPLE
SATISFIES SMPL_REQUIREMENT

Entity: KIT

Description: Contains the empty containers going out or the full containers being transported from the field to the prep lab. An example might be a cooler.

Subject area: SAMPLES

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 1500 Growth Rate: 0% per year

Attributes: KIT_PREP_DTE
KIT_ID
Relationships:
Sometimes (0%) CONTAINS many SAMPLE
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed>
KIT_ID

Entity: LAB

Description: This includes the processing labs.

Subject area: LABORATORIES

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 10 Growth Rate: 0% per year

Attributes: LAB_ZIP_CODE
LAB_STATE
LAB_CITY
LAB_STREET

```
              LAB_NAM
              LAB_CODE
Relationships:
Sometimes (0%) PERFORMS many SAMPLE_TEST
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) PERFORMS_ANALYSES_ON many SAMPLE_LAB
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) INITIATES many EXTERNAL_QC_SAMPLE
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) OWNS many LAB_INSTRUMENT
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) HAS many LAB_CONTACT
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) HAS_WRITTEN many STATEMENT_OF_WORK
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.

Identifiers:
     <unnamed>
       LAB_CODE
```

```
Entity:         LAB_COC

Description:    The LAB_COC is used to document the SAMPLEs being sent
                to a LAB.

Subject area:   SAMPLES

Properties:     Min Occ:          0 Avg Occ:          0
                Max Occ:          0 Growth Rate:      0% per year

Attributes:     LAB_COC_DTE
Relationships:
Always IS_A_TYPE_OF one DATA_FORM
    cannot transfer.
Always TRACKS_SAMPLES_FOR one SMPL_DELIVERY_GRP
    cannot transfer.

Identifiers:
     <unnamed>  (Primary)
       IS_A_TYPE_OF DATA_FORM
```

```
Entity:         LAB_CONTACT

Description:    Contacts for lab.

Subject area:   LABORATORIES

Properties:     Min Occ:          0 Avg Occ:          0
                Max Occ:          0 Growth Rate:      0% per year

Attributes:     LAB_CONT_PHONE
```

```
              LAB_CONT_NAM
Relationships:
Always CONTACT_FOR one LAB
    cannot transfer.
Always IS_CONTACT_FOR one ENV_PROJECT_TASK
    cannot transfer.

Identifiers:
     <unnamed>  (Primary)
       CONTACT_FOR LAB
       IS_CONTACT_FOR ENV_PROJECT_TASK
```

```
Entity:         LAB_INSTRUMENT

Description:    A piece of equipment used in a lab.

Subject area:   LABORATORIES

Properties:     Min Occ:          0 Avg Occ:          0
                Max Occ:          0 Growth Rate:      0% per year

Attributes:     LAB_INST_TYP
                LAB_INST_ID
Relationships:
Always IS_OWNED_BY one LAB
    cannot transfer.
Sometimes (0%) IS_USED_IN many SAMPLE_TEST
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) IS_CALIBRATED_THROUGH many LAB_INST_CALB_EVT
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.

Identifiers:
     <unnamed>  (Primary)
       LAB_INST_ID
       IS_OWNED_BY LAB
```

```
Entity:         LAB_INST_CALB_EVT

Description:    The occurence of a lab instrument tuning/adjustment.

Subject area:   LABORATORIES

Properties:     Min Occ:          0 Avg Occ:          0
                Max Occ:          0 Growth Rate:      0% per year

Attributes:     LAB_INST_LAST_TIME
                LAB_INST_LAST_DTE
                LAB_INST_CALB_CAT
                LAB_INST_CONC_LVL
                LAB_INST_GC_COL
                LAB_INST_GC_COL_ID
                LAB_INST_CALB_FILE
                LAB_INST_CALB_TYP
                LAB_INST_CALB_TIME
                LAB_INST_CALB_DTE
```

```
Relationships:
Always CALIBRATES one LAB_INSTRUMENT
    cannot transfer.
Sometimes (0%) PRODUCES many LAB_INST_CALB_RSLT
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Always IS_FOR_A one LAB_TEST
    cannot transfer.

Identifiers:
     <unnamed>  (Primary)
       LAB_INST_CALB_TIME
       LAB_INST_CALB_DTE
       CALIBRATES LAB_INSTRUMENT
       IS_FOR_A LAB_TEST
```

```
Entity:         LAB_INST_CALB_RSLT

Description:    Result from a lab instrument calibration event.

Subject area:   LABORATORIES

Properties:     Min Occ:          0 Avg Occ:          0
                Max Occ:          0 Growth Rate:      0% per year

Attributes:     INST_CALB_RSLT_SEQ
                INST_CALB_COMMENT
                INST_CALB_RSLT_TYP
                INST_CALB_RSLT_UNT
                INST_CALB_RSLT_VAL
Relationships:
Always IS_RESULT_OF one LAB_INST_CALB_EVT
    cannot transfer.
Always MEASURES one PARAMETER
    cannot transfer.

Identifiers:
     <unnamed>  (Primary)
       INST_CALB_RSLT_TYP
       IS_RESULT_OF LAB_INST_CALB_EVT
       MEASURES PARAMETER
```

```
Entity:         LAB_TEST

Description:    A unit of work to be performed on a sample which
                results in a value(s) being reported.

Subject area:   LABORATORY_TESTS

Properties:     Min Occ:          0 Avg Occ:          0
                Max Occ:        500 Growth Rate:      0% per year

Attributes:     LAB_TST_ID
                LAB_TST_NAM
                LAB_TST_TYP
                LAB_TST_HLD_FLG
                LAB_TST_HLD_QTY
```

```
              LAB_TST_HLD_UNIT
Relationships:
Sometimes (0%) HAS_AS_A_COMPONENT many LAB_TEST_PARAMETER
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) HAS_DEFINED many LAB_TEST_MATRIX
    Cardinality  Min: 1 (est) Max: 8 (est) Avg: 2
    cannot transfer.
Sometimes (0%) IS_USED_FOR many SAMPLE_TEST
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) HAS_MADE_FOR_QC many REFERENCE_MATERIAL
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) HAS many LAB_INST_CALB_EVT
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Always IS_THE_LAB_PROCEDURE_FOR one REGULATORY_METHOD
    cannot transfer.

Identifiers:
     <unnamed>  (Primary)
       LAB_TST_ID
       LAB_TST_TYP
       IS_THE_LAB_PROCEDURE_FOR REGULATORY_METHOD



Entity:         LAB_TEST_MATRIX

Description:    FULL NAME: LABORATORY TEST MATRIX

                The mapping of LAB TEST to the MATRIX(s) for which it
                is valid.  This also contains the LAB ACTIVITY defined
                to cover the LAB TEST and MATRIX.  The MATRIX may be
                identified as "ALL" for those tests that do not have
                their application limited to certain MATRIX(s).

Subject area:   LABORATORY_TESTS

Properties:     Min Occ:          0 Avg Occ:          0
                Max Occ:        500 Growth Rate:      0% per year

Attributes:     LAB_MATRX_HLD_QTY
                LAB_MATRX_HLD_UNIT
                LAB_MATRX_MIN_UNIT
                LAB_MATRX_MIN_REQD
                LAB_MATRX_DEF_UNIT
Relationships:
Always IS_DEFINED_FOR one LAB_TEST
    cannot transfer.
Always IS_DEFINED_FOR one MATRIX_TYPE
    cannot transfer.

Identifiers:
     TSTMTX01  (Primary)
       IS_DEFINED_FOR LAB_TEST
       IS_DEFINED_FOR MATRIX_TYPE
```

Entity: LAB_TEST_PARAMETER

Description: A particular chemical element, compound, physical property or other recorded value that is required for a LAB TEST.
ALIAS: LAB TEST COMPONENT (ESLIMS)

Subject area: LABORATORY_TESTS

Properties:
Min Occ: 0 Avg Occ: 0
Max Occ: 3000 Growth Rate: 0% per year

Attributes:
LTP_EPA_METH
LTP_SURRGT_FLG
LTP_HLD_UNIT
LTP_HLD_QTY

Relationships:
Sometimes (0%) HAS_DEFINED_FOR_IT many TEST_PARAM_QC_LIM
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) HAS_SPECIFIED_FOR_IT many LAB_TEST_PARAM_LIM
Cardinality Min: 1 (est) Max: 10 (est) Avg: 3
cannot transfer.
Always IS_A_COMPONENT_OF one LAB_TEST
cannot transfer.
Always REFERENCES one PARAMETER
cannot transfer.

Identifiers:
TSTCMP01 (Primary)
IS_A_COMPONENT_OF LAB_TEST
REFERENCES PARAMETER

Entity: LAB_TEST_PARAM_LIM

Description: The set of detection and reporting limits valid for the LAB TEST PARAMETER and specified MATRIX TYPE.

ALIAS: LAB TEST COMP LIMITS (ESLIMS)

Subject area: LABORATORY_TESTS

Properties:
Min Occ: 0 Avg Occ: 0
Max Occ: 3000 Growth Rate: 0% per year

Attributes:
LAB_TST_DET_LIM
LAB_TST_LOW_LIM

Relationships:
Always DEFINES_FOR one MATRIX_TYPE
cannot transfer.
Always IS_SPECIFIED_FOR one LAB_TEST_PARAMETER
cannot transfer.

Identifiers:
CMPMAT01 (Primary)
DEFINES_FOR MATRIX_TYPE
IS_SPECIFIED_FOR LAB_TEST_PARAMETER

Entity: LAB_TEST_QUAL

Description: FULL NAME: LAB TEST QUALIFIER

A distinction between different runs of a LAB TEST indicating whether the run was executed with the Sample as Disolved, Total, Initial, Total Recoverable, Etc.

Subject area: LABORATORY_TESTS

Properties:
Min Occ: 0 Avg Occ: 0
Max Occ: 50 Growth Rate: 0% per year

Attributes:
LAB_TST_QUAL_CODE
LAB_TST_QUAL_DESC

Identifiers:
TSTQUL01 (Primary)
LAB_TST_QUAL_CODE

Entity: MATRIX_TYPE

Description: A description of what is being sampled. For example, Water, Liquid Aqueous, Soil, Sediment, Air, Etc. At Y-12 this list will include their defined Material Types for the production laboratory. More general MATRIX TYPEs which will be used as a standard at all laboratories will be defined and controlled at the central level.

Subject area: LABORATORY_TESTS

Properties:
Min Occ: 0 Avg Occ: 0
Max Occ: 10 Growth Rate: 0% per year

Attributes:
MATRX_TYP_USE_CODE
MATRX_TYP_DESC
MATRX_TYP_CODE

Relationships:
Sometimes (0%) HAS_DEFINED_FOR_IT many LAB_TEST_PARAM_LIM
Cardinality Min: 1 (est) Max: 1000 (est) Avg: 100
cannot transfer.
Sometimes (0%) IS_USED_TO_DEFINE many LAB_TEST_MATRIX
Cardinality Min: 1 (est) Max: 100 (est) Avg: 50
cannot transfer.
Sometimes (0%) IS_A_CHARACTERISTIC_OF many SAMPLE
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) IS_SPECIFIED_FOR many ACTION_LIMIT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) IS_SPECIFIED_FOR many SAP_ELEMENT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) IS_A_CHARACTERISTIC_OF many EXTERNAL_QC_SAMPLE
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
MTRTYP01 (Primary)

MATRX_TYP_CODE

Entity: MEASUREMENT_UNIT

Description: A unit of measure used to gauge the level of a detected parameter.

Subject area: SYSTEM_TABLES

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 100 Growth Rate: 0% per year

Attributes: MEAS_UNIT_ABBR
MEAS_UNIT_NAM

Relationships:
Sometimes (0%) IS_CONVERTED_BY many MEAS_UNIT_CONV_FAC
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) HAS_AS_CONVERSION many MEAS_UNIT_CONV_FAC
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed>
MEAS_UNIT_ABBR

Entity: MEAS_UNIT_CONV_FAC

Description: A numerical value which is used to convert SAMPLE RESULTS and FIELD RESULTS reported in one MEASUREMENT UNIT to a preferred MEASUREMENT UNIT.

Subject area: SYSTEM_TABLES

Properties: Min Occ: 0 Avg Occ: 1
Max Occ: 100 Growth Rate: 0% per year

Attributes: MUCF_PREF_UNT_ABBR
MUCF_RPT_UNIT_ABBR
MUCF_RSLT_VAL
MUCF_RSLT_VAL_EXP

Relationships:
Always CONVERTS_TO_PREFERRED_UNIT one MEASUREMENT_UNIT
cannot transfer.
Always CONVERTS_FROM_REPORTED_UNIT one MEASUREMENT_UNIT
cannot transfer.

Identifiers:
<unnamed> (Primary)
MUCF_RPT_UNIT_ABBR
MUCF_PREF_UNT_ABBR

Entity: ME_DATA_XFER_FILE

Description: This entity shows all files used to download data from electronic collection devices for a particular MONITORING EVENT.

Subject area: MONITORING_EVENTS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: ME_DATA_FILE_DTE
Relationships:
Always HAS_DATA_STORED_BY one DATA_XFER_FILE
cannot transfer.
Always CONTAINS_DATA_PERTAINING_TO one MONITORING_EVENT
cannot transfer.

Identifiers:
<unnamed> (Primary)
HAS_DATA_STORED_BY DATA_XFER_FILE
CONTAINS_DATA_PERTAINING_TO MONITORING_EVENT

Entity: MONITORING_EVENT

Description: Monitoring events are initiated by the monitoring plan or special requests and include the date, time and location monitored.

Subject area: MONITORING_EVENTS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 2000 Growth Rate: 0% per year

Attributes: ME_END_TIME
ME_END_DTE
ME_COMMENT
ME_SEQ_NO
ME_WEATHER
ME_BEG_TIME
ME_BEG_DTE
Relationships:
Always OCCURS_AT one ENV_PROJ_TASK_LOC
cannot transfer.
Sometimes (0%) HAS_COLLECTED many SAMPLE
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) REQUIRES many PURGE_EVENT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) HAS_TAKEN many FIELD_MEASUREMENT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) HAS_INFO_RECORDED_BY many MONIT_EVT_DATA_FRM
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) HAS_COORDINATES_DEFINED_BY one GPS_LOCATION
cannot transfer.
Sometimes (0%) IS one DRILLING_EVENT
cannot transfer.
Sometimes (0%) IS one WELL_DEV_EVENT
cannot transfer.

```
Sometimes (0%) IS one WELL_MOD_EVENT
    cannot transfer.
Sometimes (0%) IS one WELL_INSTALL_EVENT
    cannot transfer.
Sometimes (0%) HAS_DATA_STORED_BY many ME_DATA_XFER_FILE
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) IS_PERFORMED_BY one MONITORING_TEAM
    cannot transfer.

Identifiers:
     <unnamed>  (Primary)
       ME_BEG_DTE
       ME_SEQ_NO
       OCCURS_AT ENV_PROJ_TASK_LOC
```

```
Entity:          MONITORING_TEAM

Description:     A group of people who collect FIELD MEASUREMENTs and/or
                 SAMPLES.

Subject area:    MONITORING_TEAMS

Properties:      Min Occ:          0 Avg Occ:          0
                 Max Occ:          0 Growth Rate:      0% per year

Attributes:      MONIT_TEAM_ID
Relationships:
Always IS_COMPOSED_OF many TEAM_MEMBER_ROLE
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) PERFORMS many MONITORING_EVENT
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.

Identifiers:
     <unnamed>  (Primary)
       MONIT_TEAM_ID
```

```
Entity:          MONIT_EVT_DATA_FRM

Description:     The data form which is associated with a monitoring
                 event.

Subject area:    MONITORING_EVENTS

Properties:      Min Occ:          0 Avg Occ:          0
                 Max Occ:          0 Growth Rate:      0% per year

Attributes:      MONIT_DATA_FRM_DTE
Relationships:
Always HAS_INFO_RECORDED_BY one DATA_FORM
    cannot transfer.
Always CONTAINS_INFO_ABOUT one MONITORING_EVENT
    cannot transfer.

Identifiers:
```

<unnamed> (Primary)
HAS_INFO_RECORDED_BY DATA_FORM
CONTAINS_INFO_ABOUT MONITORING_EVENT

Entity: MONIT_FREQUENCY

Description: A specified frequency for the collection of a sample or field measurement.
Examples:
'1/7' - Weekly
'1/365' - Once per year
'2/7' - Twice per week

Subject area: ENVIRONMENTAL_PROJECTS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: MONIT_FREQ_CODE
MONIT_FREQ_DESC

Relationships:
Sometimes (0%) INDICATES_HOW_OFTEN_TO_PERFORM many SAP_ELEMENT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed>
MONIT_FREQ_CODE

Entity: MONIT_LOCATION

Description: A physical location where monitoring may be performed, i.e., a well, borehole, seep/spring, etc.

Subject area: MONITORING_LOCATIONS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 2000 Growth Rate: 0% per year

Attributes: ML_GPS_VAR_CODE
ML_MARKER_UNIT
ML_MARKER_NO
ML_NAM
ML_STAT_CODE
ML_MEAS_ERR
ML_MEAS_METH
ML_ELEV_MEAS_METH
ML_ELEV_MEAS_ERR
ML_NORTHING
ML_EASTING
ML_GND_ELEV
ML_COMMENT
ML_GRID_SYS
ML_DESC
ML_TYP
ML_ID

Relationships:

```
Sometimes (0%) IS_GROUPED_BY many ENV_PROJ_TASK_LOC
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) MAY_BE one BORE_HOLE
    cannot transfer.
Sometimes (0%) HAS_IN_SERVICE_TIME_OF many MONIT_LOC_SRVC_PER
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) IS_GROUPED_BY many AREA_GRP_LOCATION
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) HAS_MEASURED many ENV_MON_LOC_FLOW
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) HAS many USGS_WEIR_FLOW
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) IS_SPECIFIED_FOR many SAP_ELEMENT
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) MAY_BE one WELL
    cannot transfer.
Sometimes (0%) WAS_KNOWN_AS many MONIT_LOC_ALIAS
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) REPRESENTS one RIVER
    cannot transfer.
Sometimes (0%) HAS_ASSIGNED_TO_IT many EQUP_LOC_INIT_EVT
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) HAS_COORDINATES_DEFINED_BY one GPS_LOCATION
    cannot transfer.

Identifiers:
     <unnamed>
       ML_ID



Entity:         MONIT_LOC_ALIAS

Description:    Former name for a MONITORING LOCATION.

Subject area:   MONITORING_LOCATIONS

Properties:     Min Occ:          0 Avg Occ:          0
                Max Occ:        100 Growth Rate:      0% per year

Attributes:     MLA_BEG_DTE
                MLA_NAM
                MLA_ID
Relationships:
Always WAS_ANOTHER_NAME_FOR one MONIT_LOCATION
    cannot transfer.

Identifiers:
     <unnamed>  (Primary)
       MLA_ID
       WAS_ANOTHER_NAME_FOR MONIT_LOCATION
```

Entity: MONIT_LOC_SRVC_PER

Description: Information for when a monitoring location is actually being monitored is found here. This includes the date when the monitoring began and the date when it ended.

Subject area: MONITORING_LOCATIONS

Properties:
Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes:
MLSP_COMMENT
MLSP_END_DTE
MLSP_BEG_DTE

Relationships:
Always IS_IN_SERVICE_TIME_OF one MONIT_LOCATION
cannot transfer.

Identifiers:
<unnamed> (Primary)
MLSP_BEG_DTE
IS_IN_SERVICE_TIME_OF MONIT_LOCATION

Entity: PARAMETER

Description: A chemical element, a chemical compound, or physical attribute or condition for which laboratory or field technicians may perform an analytical test or observation in order to determine compliance with a MONITORING OBJECTIVE.

Subject area: LABORATORY_TESTS

Properties:
Min Occ: 0 Avg Occ: 0
Max Occ: 300 Growth Rate: 0% per year

Attributes:
PARAM_CODE
PARAM_ABBR
PARAM_CAS_ID
PARAM_STD_NAM

Relationships:
Sometimes (0%) IS_SPECIFIED_FOR many PT_ANLY_CAT_MATRIX
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) QUANTIFIES many FIELD_MEASUREMENT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) IS_SPECIFIED_FOR many SAP_ELEMENT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) IS_SPECIFIED_FOR many ACTION_LIMIT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) QUANTIFIES many SAMPLE_RESULT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) IS_REFERENCE_AS many LAB_TEST_PARAMETER
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Sometimes (0%) IS_SPECIFIED_IN many REF_MATL_ANALYTE
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) IS_SPECIFIED_AS many QC_ANALYTE
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) IS_MEASURED_IN many LAB_INST_CALB_RSLT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) IS_CALLED_OUT_BY many SOW_METH_PARAM
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed> (Primary)
PARAM_CODE

Entity: PARAM_ANALYSIS_CAT

Description: A high-level grouping of PARAMETERs and/or PARAMETER ANALYSIS GROUPs (i.e. RADs, METALs, ORGANICs, INORGANICs, etc.)

Subject area: ENVIRONMENTAL_PROJECTS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 50 Growth Rate: 0% per year

Attributes: PARAM_ANLY_CAT_NAM
PARAM_ANLY_CAT_COD

Relationships:
Sometimes (0%) IS_USED_TO_ANALYZE_SAMPLES_FOR many PT_ANLY_CAT_MATRIX
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Always IS_REQUESTED_AS_ANALYSIS_FOR many SAMPLE
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed>
PARAM_ANLY_CAT_COD

Entity: PARAM_ANALYSIS_GRP

Description: A grouping of PARAMETERs specified in a Statement of Work which are to be analyzed by a particular method to produce specific results (i.e. semivols, vols, etc.)

Subject area: ENVIRONMENTAL_PROJECTS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 50 Growth Rate: 0% per year

Attributes: PARAM_ANLY_GRP_NAM
PARAM_ANLY_GRP_COD

Relationships:
Sometimes (0%) IS_SPECIFIED_FOR many PT_ANLY_CAT_MATRIX

Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) CONSISTS_OF many SOW_METH_PARAM
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed>
PARAM_ANLY_GRP_COD

Entity: PLUGGING_EVENT

Description: A closing of a well or a bore hole that will no longer be monitored.

NOTE: The relationships from well and bore hole are an either/or situation. For the plugging event to exist, a relationship from either a well or a bore hole must exist. The identifier for this entity is the Location Id from the well or the bore hole and the Plugging Event Date. The relationships are not shown as identifying relationships on the model because of the either/or case.

Subject area: WELLS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: PLUG_EVT_LOC_ID
PLUG_EVT_DTE

Relationships:
Sometimes (0%) PERMANENTLY_CLOSES one WELL
cannot transfer.
Sometimes (0%) PERMANENTLY_CLOSES one BORE_HOLE
cannot transfer.
Always RESULTS_IN many PLUG_INTV_MATERIAL
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed> (Primary)
PLUG_EVT_DTE
PLUG_EVT_LOC_ID

Entity: PLUGGING_METHOD

Description: A process used to fill a WELL or BORE HOLE in order to prevent any further activities to be performed at that location.

Subject area: WELLS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: PLUG_METH_NAM

PLUG_METH_DESC
Relationships:
Sometimes (0%) IS_USED_TO_CREATE many PLUG_INTV_MATERIAL
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed> (Primary)
PLUG_METH_NAM

Entity: PLUG_INTV_MATERIAL

Description: An occurrence of a particular PLUG MATERIAL used to a particular portion of a BORE HOLE or WELL.

Subject area: WELLS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: PLUG_INTV_END_DPTH
PLUG_INTV_BEG_DPTH
Relationships:
Always RESULTS_FROM one PLUGGING_EVENT
cannot transfer.
Always IS_CREATED_USING one PLUGGING_METHOD
cannot transfer.
Always USES one PLUG_MATERIAL
cannot transfer.

Identifiers:
<unnamed> (Primary)
RESULTS_FROM PLUGGING_EVENT
USES PLUG_MATERIAL

Entity: PLUG_MATERIAL

Description: The material used to plug a well or bore hole.

Subject area: WELLS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: PLUG_MATL_NAM
PLUG_MATL_CODE
Relationships:
Sometimes (0%) USED_FOR many PLUG_INTV_MATERIAL
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed>
PLUG_MATL_CODE

Entity: PRESERVATIVE

Description: The type of liquid used with a SAMPLE to reduce or prevent it from spoiling or decaying.

Subject area: SAMPLES

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 50 Growth Rate: 0% per year

Attributes: PRESERVATIVE_NAM
PRESERVATIVE_CODE

Relationships:
Always IS_USED_TO_PRESERVE many SAMPLE
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Always IS_SPECIFIED_BY many SMPL_REQUIREMENT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed>
PRESERVATIVE_CODE

Entity: PT_ANLY_CAT_MATRIX

Description: This entity breaks down the PARAMETER ANALYSIS CATEGORY into the PARAMETER ANALYSIS GROUP or PARAMETER to be analyzed by the lab for a given ENV PROJECT TASK.

Subject area: ENVIRONMENTAL_PROJECTS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: PT_ANLY_MATRX_DTE
Relationships:
Always IS_ANALYZED_FOR one PARAM_ANALYSIS_CAT
cannot transfer.
Sometimes (0%) SPECIFIES one PARAM_ANALYSIS_GRP
cannot transfer.
Sometimes (0%) SPECIFIES one PARAMETER
cannot transfer.
Always COLLECTS_SAMPLES_FOR one ENV_PROJECT_TASK
cannot transfer.

Identifiers:
<unnamed> (Primary)
IS_ANALYZED_FOR PARAM_ANALYSIS_CAT
COLLECTS_SAMPLES_FOR ENV_PROJECT_TASK

Entity: PURGE_EVENT

Description: The removal of stagnant water from a well prior to

taking a sample.

Subject area: MONITORING_EVENTS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: PURG_EVT_WTR_DISP
PURG_EVT_SEQ_NO
PURG_EVT_VOL_UNIT
PURG_EVT_PURG_VOL
PURG_EVT_TIME

Relationships:
Always HAS_WELL_WATER_REMOVED_VIA one PURGE_METHOD
cannot transfer.
Always CLEARS_WATER_FOR one MONITORING_EVENT
cannot transfer.

Identifiers:
<unnamed> (Primary)
PURG_EVT_SEQ_NO
CLEARS_WATER_FOR MONITORING_EVENT

Entity: PURGE_METHOD

Description: A standard method defined for purging a well.

Subject area: MONITORING_EVENTS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: PURG_METH_DESC
PURG_METH_CODE

Relationships:
Sometimes (0%) IS_USED_TO_REMOVE_WATER_DURING many PURGE_EVENT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed>
PURG_METH_CODE

Entity: QC_ANALYTE

Description: A known ANALYTE value for the QC Sample.

Subject area: SAMPLES

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 300 Growth Rate: 0% per year

Attributes: QCA_LOW_QUAL_LIM
QCA_UP_QUAL_LIM
QCA_CONC_UNIT
QCA_CONC_VAL

Relationships:

Always IS_KNOWN_VALUE_FOR one QC_MATERIAL
    cannot transfer.
Always SPECIFIES one PARAMETER
    cannot transfer.

Identifiers:
     EXQCAN01 (Primary)
       IS_KNOWN_VALUE_FOR QC_MATERIAL
       SPECIFIES PARAMETER

Entity: QC_MATERIAL

Description: FULL NAME: INTERNAL QUALITY CONTROL MATERIAL

A material from which a SAMPLE was prepared by an organization external to the laboratory and for which there are known analyte values. These materials are referenced when the external organization submits a blind QC sample to the laboratory for the purpose of testing laboratory performance. This material needs to be added in the ESLIMS only when the known values are to be used to determine the performance of a laboratory technician and to maintain ANALYST QUALIFICATION information.

Subject area: SAMPLES

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 100 Growth Rate: 0% per year

Attributes: QC_MATL_DESC
QC_MATL_ID

Relationships:
Sometimes (0%) HAS_AS_KN UE many QC_ANALYTE
    Cardinality Min: 1 ax: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) COMPOSES ma NT_QC_SAMPLE
    Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.

Identifiers:
     EXTQC01 (Primary)
       QC_MATL_ID

Entity: QC_RESULT

Description: FULL NAME: QC RESULT

A result obtained by performing a calculation between results obtained for a QC SAMPLE. The QC RESULT is recorded with the result for the QC SAMPLE.

Subject area: SAMPLE_RESULTS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 100000 Growth Rate: 0% per year

Attributes: QC_RSLT_UNIT
QC_RSLT_VAL
QC_RSLT_DESC
Relationships:
Always IS_IDENTIFIED_AS one QC_TYPE_COMPONENT
cannot transfer.
Always IS_CALCULATED_FOR one SAMPLE_RESULT
cannot transfer.

Identifiers:
QCRSLT01 (Primary)
IS_IDENTIFIED_AS QC_TYPE_COMPONENT
IS_CALCULATED_FOR SAMPLE_RESULT

Entity: QC_SMPL_REF_MATL

Description: The REFERENCE MATERIAL from which the QC SAMPLE itself was taken or from which the solution added to the QC SAMPLE came.

Subject area: QC_TYPES

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 500 Growth Rate: 0% per year

Attributes: QCS_FNL_QTY_UNIT
QCS_FNL_QTY
QCS_ADD_QTY_UNIT
QCS_ADD_QTY_VAL
Relationships:
Always HAS_AS_SPECIFIED_REF_MATERIAL one REFERENCE_MATERIAL
cannot transfer.
Always SPECIFIES_AS_QC_SAMPLE one EXTERNAL_QC_SAMPLE
cannot transfer.

Identifiers:
SAMREF01 (Primary)
HAS_AS_SPECIFIED_REF_MATERIAL REFERENCE_MATERIAL
SPECIFIES_AS_QC_SAMPLE EXTERNAL_QC_SAMPLE

Entity: QC_TYPE

Description: A general category of Quality Control Samples. Examples of control types are: Calibration Standard (initial, continuing), Blank Spike, Matrix Spike, Matrix Spike Duplicate, Blank (prep),

Subject area: QC_TYPES

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 100 Growth Rate: 0% per year

Attributes: QCT_INT_EXT_CODE
QCT_NAM
QCT_CODE
Relationships:
Sometimes (0%) HAS_AS_REQUIRED_VALUE_ENTRY many QC_TYPE_COMPONENT

Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) HAS_AS_AN_INSTANCE many EXTERNAL_QC_SAMPLE
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) IS_PERFORMED_USING many REFERENCE_MATERIAL
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) CATEGORIZES many INT_QC_SAMPLE
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
QCTYPE01 (Primary)
QCT_CODE

Entity: QC_TYPE_COMPONENT

Description: The information required to be recorded for a particular Quality Control type. Examples are: amount spiked, mass, volume, % recovery, Etc.

Subject area: QC_TYPES

Properties:

Min Occ:	0	Avg Occ:	0
Max Occ:	1000	Growth Rate:	0% per year

Attributes:
QCTC_SIG_DIGIT_QTY
QCTC_DEF_UNIT
QCTC_VAL_FORMAT
QCTC_VAL_LEN
QCTC_VAL_TYP
QCTC_NAM

Relationships:
Sometimes (0%) HAS_DEFINED_FOR_IT many TEST_PARAM_QC_LIM
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) HAS_IDENTIFIED_FOR_IT many QC_RESULT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Always IS_REQUIRE_VALUE_ENTRY_FOR one QC_TYPE
cannot transfer.

Identifiers:
QCCOMP01 (Primary)
QCTC_NAM
IS_REQUIRE_VALUE_ENTRY_FOR QC_TYPE

Entity: REFERENCE_MATERIAL

Description: A reference material having a specified value(s) against which measurements are compared. Examples of reference materials are primary standards, secondary standards, and spike solutions. A Standard is certified by a recognized authority and is traceable to a primary reference standard. The standard may be a solution prepared by the manufacturer (primary

reference standard) or a lab standard which is a portion of the primary standard that has been diluted such that the analyte concentrations are at a desired level. Reference materials are used for QC in the calibration of instruments, as the source of Spike solutions, as surrogates, Etc.

Subject area: QC_TYPES

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 100 Growth Rate: 0% per year

Attributes: REF_MATL_DESC
REF_MATL_NO

Relationships:
Sometimes (0%) IS_SURROGATE_ADDED many SAMPLE_REF_MATL
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) IS_SPECIFIED_REF_MATERIAL_FOR many QC_SMPL_REF_MATL
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) HAS_KNOWN_VALUE_OF many REF_MATL_ANALYTE
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) IS_MADE_FOR one LAB_TEST
cannot transfer.
Sometimes (0%) IS_USED_TO_PERFORM one QC_TYPE
cannot transfer.
Sometimes (0%) IS_USED_TO_OBTAIN_THE_CONC_FOR many REF_MATL_ANALYTE
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
REFMTL01 (Primary)
REF_MATL_NO

Entity: REF_MATL_ANALYTE

Description: The known value for a given component of a REFERENCE MATERIAL.

Subject area: QC_TYPES

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 300 Growth Rate: 0% per year

Attributes: RMA_CONC_UNIT
RMA_CONC_VAL

Relationships:
Always IS_KNOWN_VALUE_FOR one REFERENCE_MATERIAL
cannot transfer.
Always SPECIFIES one PARAMETER
cannot transfer.
Sometimes (0%) HAD_USED_TO_OBTAIN_CONC one REFERENCE_MATERIAL
cannot transfer.

Identifiers:
REFANL01 (Primary)
IS_KNOWN_VALUE_FOR REFERENCE_MATERIAL
SPECIFIES PARAMETER

Entity: REGULATORY_METHOD

Description: A standard analytical method of measurement or observation defined by a regulatory agency such as EPA or NIOSH and used in a laboratory or in the field to determine the level of a parameter in a medium such as water or soil. This may also be a method used to prepare a sample for analysis.

Subject area: LABORATORY_TESTS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 100 Growth Rate: 0% per year

Attributes: REG_METH_AGENCY
REG_METH_ID
REG_METH_DESC
REG_METH_NAM

Relationships:
Always IS_THE_REGULATORY_METHOD_FOR many LAB_TEST
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
RGMETH01 (Primary)
REG_METH_AGENCY
REG_METH_ID

Entity: RIVER

Description: A body of water. May be a river, creek, or stream.

Subject area: MONITORING_LOCATIONS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 10 Growth Rate: 0% per year

Attributes: RIVER_NAM
RIVER_ID

Relationships:
Sometimes (0%) IS_SITE_OF many MONIT_LOCATION
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed> (Primary)
RIVER_ID

Entity: SAMPLE

Description: An individual specimen that is designated to be analyzed for specific parameters using specified analytical methods, and is collected in accordance with

laboratory test requirements. For example: A specific parameter must be analyzed from a sample containing at least 50 ml, prepared with HCL preservative, and must be in a bottle which is made of polyethylene.

NOTE: The relationship between SAMPLE AND MONITORING EVENT is mandatory if the SAMPLE is not a composite. If it is a composite SAMPLE, then the relationship to MONITORING EVENT is optional and the tie is through each of the individual SAMPLES making up the composite.

Subject area: SAMPLES

Properties:
Min Occ: 0 Avg Occ: 0
Max Occ: 50000 Growth Rate: 0% per year

Attributes:
SMPL_GEN_HIST_ID
SMPL_HIST_ID
SMPL_COMPOSITE_FLG
SMPL_BIOTA_STAT
SMPL_SPECIES
SMPL_PROC_TYP_CODE
SMPL_BANK_CODE
SMPL_SEDIMENT_TYP
SMPL_STAT_CODE
SMPL_INTV_UNIT
SMPL_CERT_LOT_NO
SMPL_COLL_EQUP_SER
SMPL_DTE
SMPL_TIME
SMPL_FLD_LOG_BG_PG
SMPL_END_INTV
SMPL_BEG_INTV
SMPL_ID
SMPL_COMPL_CHK_FLG
SMPL_COMMENT

Relationships:
Sometimes (0%) HAS_A_SURROGATE_ADDITION many SAMPLE_REF_MATL
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) BELONGS_TO one KIT
cannot transfer.
Sometimes (0%) HAS_PERFORMED many SAMPLE_TEST
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) IS_ANALYZED_BY many SAMPLE_LAB
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Always IS_PLACED_INTO one SMPL_CONT_TYPE
cannot transfer.
Sometimes (0%) IS_CATEGORIZED_AS one SAMPLE_TYPE
cannot transfer.
Sometimes (0%) MAY_BE one INT_QC_SAMPLE
cannot transfer.
Sometimes (0%) IS_COLLECTED_DURING one MONITORING_EVENT
cannot transfer.
Sometimes (0%) IS_COLLECTED_BY one SAMPLER_TYPE
cannot transfer.
Always IS_COLLECTED_USING one SAMPLING_PROCEDURE
cannot transfer.
Sometimes (0%) TRIGGERS many EXCEPTION_EVENT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

```
Sometimes (0%) IS_THE_COMPOSITE_OF many SAMPLE
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) IS_COMBINED_INTO one SAMPLE
    cannot transfer.
Sometimes (0%) IS_SPLIT_INTO many SAMPLE
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Always IS_RESULT_OF_SPLITTING one SAMPLE
    cannot transfer.
Sometimes (0%) IS_PRESERVED_BY one PRESERVATIVE
    cannot transfer.
Sometimes (0%) IS_CHARACTERIZED_BY many SAMPLE_WASTE_CODE
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) HAS_AS_A_CHARACTERISTIC one MATRIX_TYPE
    cannot transfer.
Sometimes (0%) HAS_INFO_RECORDED_ABOUT_IT_ON many SMPL_ASSOC_FORM
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) IS_TRACKED_BY one FIELD_COC
    cannot transfer.
Sometimes (0%) IS_REQUESTED_TO_BE_ANALYZED_FOR one PARAM_ANALYSIS_CAT
    cannot transfer.
Sometimes (0%) IS_USED_TO_MAKE many EXTERNAL_QC_SAMPLE
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) HAS_AS_QC_SAMPLE many SMPL_ASSOC_INT_QC
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) IS_GROUPED_BY one SAMPLE_PAIR_TYPE
    cannot transfer.

Identifiers:
     <unnamed>
       SMPL_ID
```

```
Entity:          SAMPLER_TYPE

Description:     The type of equipment used during a SAMPLING
                 OCCURRENCE to collect a SAMPLE.

Subject area:    SAMPLES

Properties:      Min Occ:          0 Avg Occ:          0
                 Max Occ:         20 Growth Rate:      0% per year

Attributes:      SMPLR_TYP_DESC
                 SMPLR_TYP_CODE
Relationships:
Sometimes (0%) IS_USED_TO_COLLECT many SAMPLE
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.

Identifiers:
     <unnamed>
       SMPLR_TYP_CODE
```

Entity: SAMPLE_LAB

Description: This entity associates a SAMPLE with the LABS that are used to do analyses on it.

Subject area: SAMPLES

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 75000 Growth Rate: 0% per year

Attributes: SMPL_LAB_ID
SMPL_LAB_BATCH_ID

Relationships:
Always PERFORMS_ANALYSES_ON one SAMPLE
cannot transfer.
Always IS_ANALYZED_BY one LAB
cannot transfer.
Always IS_ASSIGNED_TO one SMPL_DELIVERY_GRP
cannot transfer.

Identifiers:
<unnamed> (Primary)
PERFORMS_ANALYSES_ON SAMPLE
IS_ANALYZED_BY LAB

Entity: SAMPLE_PAIR_TYPE

Description: This contains information for the hydrograph sample pair type. Types include: Start Pair, Peak Pair, End Pair, Rising Pair, and Falling Pair.

Subject area: SAMPLES

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: SMPL_PAIR_TYP_NAM
SMPL_PAIR_TYP_CODE

Relationships:
Sometimes (0%) GROUPS many SAMPLE
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed> (Primary)
SMPL_PAIR_TYP_CODE

Entity: SAMPLE_REF_MATL

Description: This shows the REFERENCE MATL added as a surrogate to a SAMPLE.

Subject area: QC_TYPES

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

```
Attributes:     SMPL_REF_MATL_DTE
Relationships:
Always IS_SURROGATE_ADDED one SAMPLE
    cannot transfer.
Always HAS_A_SURROGATE_ADDITION one REFERENCE_MATERIAL
    cannot transfer.

Identifiers:
     <unnamed>  (Primary)
       HAS_A_SURROGATE_ADDITION REFERENCE_MATERIAL
       IS_SURROGATE_ADDED SAMPLE



Entity:         SAMPLE_RESULT

Description:    Information obtained from the analysis of a SAMPLE.

Subject area:   SAMPLE_RESULTS

Properties:     Min Occ:          0 Avg Occ:          0
                Max Occ:     350000 Growth Rate:      0% per year

Attributes:     SR_SEQ_NO
                SR_MISD_HLD_TIM_QL
                SR_OUT_CST_LIM_FLG
                SR_CNF_LVL_LIM_FLG
                SR_CONF_LVL
                SR_PREFIX_QUAL
                SR_DATA_USE_QUAL
                SR_COMMENT
                SR_TENTV_ID_COMPND
                SR_REV_COMMENT
                SR_REV_FLG
                SR_DILUTION_FAC
                SR_CONV_UNIT
                SR_CONV_VAL
                SR_RPT_UNIT
                SR_RPT_VAL
                SR_ID
Relationships:
Always IS_PRODUCED_BY one SAMPLE_TEST
    cannot transfer.
Always HAS_ASSIGNED_TO_IT one DATA_USE_QUALIFIER
    cannot transfer.
Sometimes (0%) TRIGGERS many EXCEPTION_EVENT
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Always IS_QUANTIFIED_BY one PARAMETER
    cannot transfer.
Sometimes (0%) HAS_CALCULATED_FOR_IT many QC_RESULT
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.
Sometimes (0%) IS_QUALIFIED_BY many SMPL_RSLT_QUAL
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.

Identifiers:
     <unnamed>  (Primary)
       SR_ID
       SR_SEQ_NO
```

IS_PRODUCED_BY SAMPLE_TEST
IS_QUANTIFIED_BY PARAMETER

Entity: SAMPLE_TEST

Description: A specific sample processing step. ALIAS: SAMPLE TEST

NOTE: Since this may be a prep, extraction, or analysis, we may subtype out the analysis type in IEF and tie it to the SAMPLE RESULT since it is the only one that would have results associated with it. Preps and Extractions do not have results.

Subject area: SAMPLES

Properties:

Min Occ:	0	Avg Occ:	0
Max Occ:	350000	Growth Rate:	0% per year

Attributes:
SMPL_TST_COMMENT
SMPL_TST_ASSOC_TYP
SMPL_TST_ASSOC_ID
SMPL_TST_CST
SMPL_TST_LAB_FILE
SMPL_TST_GC_ID
SMPL_TST_GC_COL
SMPL_TST_LVL
SMPL_TST_COMPL_TIM
SMPL_TST_COMPL_DTE
SMPL_TST_BATCH_POS
SMPL_TST_END_QTY
SMPL_TST_QTY_UNIT
SMPL_TST_INIT_QTY
SMPL_TST_BATCH_NO
SMPL_TST_TIME
SMPL_TST_DTE
SMPL_TST_SEQ_NO

Relationships:
Sometimes (0%) IS_PERFORMED_ON one SAMPLE
cannot transfer.
Always IS_PERFORMED_AT one LAB
cannot transfer.
Sometimes (0%) PRODUCES many SAMPLE_RESULT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Always USES one LAB_TEST
cannot transfer.
Sometimes (0%) IS_REQUESTED_FOR one EXTERNAL_QC_SAMPLE
cannot transfer.
Sometimes (0%) USES one LAB_INSTRUMENT
cannot transfer.

Identifiers:
<unnamed> (Primary)
SMPL_TST_SEQ_NO
SMPL_TST_ASSOC_ID
SMPL_TST_ASSOC_TYP
USES LAB_TEST

Entity: SAMPLE_TYPE

Description: A general class of SAMPLEs.

Subject area: SAMPLES

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 100 Growth Rate: 0% per year

Attributes: SMPL_TYP_NAM
SMPL_TYP_DESC
SMPL_TYP_CODE

Relationships:
Sometimes (0%) CATEGORIZES many SAMPLE
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed>
SMPL_TYP_CODE

Entity: SAMPLE_WASTE_CODE

Description: A waste code which specifies a characteristic of the sample as a means of identifying how the sample should be handled if all or a portion of it were to remain unused after analysis, thus becoming waste.

Subject area: SAMPLES

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: SMPL_WST_CODE_DTE

Relationships:
Always SPECIFIES one WASTE_CODE
cannot transfer.
Always IS_USED_TO_CHARACTERIZE one SAMPLE
cannot transfer.

Identifiers:
SMPWST01 (Primary)
SPECIFIES WASTE_CODE
IS_USED_TO_CHARACTERIZE SAMPLE

Entity: SAMPLING_PROCEDURE
(SAMPLING_METHOD)

Description: The method or procedure used to collect a sample. Sampling procedures are identified in the sampling and analysis plan.

ALIAS : SAMPLING METHOD

Subject area: SAMPLES

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 50 Growth Rate: 0% per year

Attributes: SMPL_PROCED_REV
SMPL_PROCED_DESC
SMPL_PROCED_NO

Relationships:
Sometimes (0%) IS_USED_IN_COLLECTING many SAMPLE
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) IS_SPECIFIED_FOR many SAP_ELEMENT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed> (Primary)
SMPL_PROCED_NO
SMPL_PROCED_REV

Entity: SAP_ELEMENT

Description: A specific requirement to monitor for a specific PARAMETER at a specific MONITORING FREQUENCY. The objective also identifies the REQUIREMENT SOURCE (e.g RCRA, Environmental Surveillance) and SAMPLING PROCEDURE to be used.

Subject area: ENVIRONMENTAL_PROJECTS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 50 Growth Rate: 0% per year

Attributes: SAP_ELE_ACT_DTE
SAP_ELE_INACT_DTE
SAP_ELE_DTE
SAP_ELE_ID

Relationships:
Always IS_IDENTIFIED_IN one SMPL_ANLY_PLAN
cannot transfer.
Sometimes (0%) TRIGGERS many EXCEPTION_EVENT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Always SPECIFIES one SAMPLING_PROCEDURE
cannot transfer.
Sometimes (0%) SPECIFIES many SMPL_REQUIREMENT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Always HAS_SPECIFIED one MONIT_LOCATION
cannot transfer.
Always IS_PERFORMED_AT_A_SPECIFIED one MONIT_FREQUENCY
cannot transfer.
Always HAS_SPECIFIED one PARAMETER
cannot transfer.
Always HAS_SPECIFIED one MATRIX_TYPE
cannot transfer.

Identifiers:
<unnamed> (Primary)
SAP_ELE_ACT_DTE

SPECIFIES SAMPLING_PROCEDURE
HAS_SPECIFIED MONIT_LOCATION
IS_PERFORMED_AT_A_SPECIFIED MONIT_FREQUENCY
HAS_SPECIFIED PARAMETER

Entity: SDG_SHIP_CONTNR

Description: Container for a sample delivery group.

Subject area: SAMPLES

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: SDG_SHIP_ORD_FRM
SDG_TEMP_UNIT
SDG_RCPT_COND
SDG_RCV_TEMP
SDG_SHIP_TEMP
SDG_CONTNR_TYP
SDG_CONTNR_NO

Relationships:
Sometimes (0%) CONTAINS one SMPL_DELIVERY_GRP
cannot transfer.

Identifiers:
<unnamed> (Primary)
SDG_CONTNR_NO

Entity: SMPL_ANLY_PLAN

Description: A program of action developed before field activities that describes the methods and procedures for obtaining representative portions of the environment being investigated.

Subject area: ENVIRONMENTAL_PROJECTS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 10 Growth Rate: 0% per year

Attributes: SAP_MONIT_PLAN_ID
SAP_ACT_DTE
SAP_ID

Relationships:
Always IDENTIFIES many SAP_ELEMENT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Always IS_FOR one ENV_PROJECT
cannot transfer.

Identifiers:
<unnamed>
SAP_ID

Entity: SMPL_ASSOC_FORM

Description: An association between a SAMPLE and a SAMPLE DATA FORM to which it is related.

Subject area: SAMPLES

Properties:
Min Occ:	0	Avg Occ:	0
Max Occ:	0	Growth Rate:	0% per year

Attributes: SMPL_ASSOC_FRM_DTE
Relationships:
Always CONTAINS_INFORMATION_ABOUT one SAMPLE
cannot transfer.
Always HAS_INFO_RECORDED_ABOUT_IT_ON one DATA_FORM
cannot transfer.

Identifiers:
<unnamed> (Primary)
CONTAINS_INFORMATION_ABOUT SAMPLE
HAS_INFO_RECORDED_ABOUT_IT_ON DATA_FORM

Entity: SMPL_ASSOC_INT_QC

Description: An association between a SAMPLE and INT QC SAMPLE to which it is related.

Subject area: SAMPLES

Properties:
Min Occ:	0	Avg Occ:	0
Max Occ:	0	Growth Rate:	0% per year

Attributes: SMPL_ASSOC_QC_DTE
Relationships:
Always APPLIES_TO one SAMPLE
cannot transfer.
Always HAS_AS_QC_SAMPLE one INT_QC_SAMPLE
cannot transfer.

Identifiers:
<unnamed> (Primary)
APPLIES_TO SAMPLE
HAS_AS_QC_SAMPLE INT_QC_SAMPLE

Entity: SMPL_CONT_TYPE

Description: A type of container defined for use in collecting and storing SAMPLES.

Subject area: SAMPLES

Properties:
Min Occ:	0	Avg Occ:	0
Max Occ:	100	Growth Rate:	0% per year

Attributes: SMPL_CONT_MIN_VOL
SMPL_CONT_UNT_ABBR

SMPL_CONT_MATL_COD
Relationships:
Sometimes (0%) HAS_PLACED_INTO_IT many SAMPLE
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) IS_SPECIFIED_FOR many SMPL_REQUIREMENT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed> (Primary)
SMPL_CONT_MATL_COD
SMPL_CONT_UNT_ABBR
SMPL_CONT_MIN_VOL

Entity: SMPL_DELIVERY_GRP

Description: A group of samples taken, defined as 20 or fewer field samples within a case, assigned by the EPA Sample Management Office for analysis performed in accordance with Contract Laboratory Program (CLP) methods, received over a period of up to 14 calendar days. Data from all samples in a SAMPLE DELIVERY GROUP are due concurrently.

Subject area: SAMPLES

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 2000 Growth Rate: 0% per year

Attributes: SDG_FIN_RPT_DTE
SDG_RPT_DUE_DTE
SDG_EPA_CASE_NO
SDG_ANLY_REQD_DTE
SDG_LAB_SHP_DTE
SDG_LAB_RCD_DTE
SDG_SHP_CONT_NO
SDG_NO
Relationships:
Always CONTAINS many SAMPLE_LAB
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) IS_SHIPPED_IN many SDG_SHIP_CONTNR
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) HAS_SAMPLES_TRACKED_BY many LAB_COC
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed>
SDG_NO

Entity: SMPL_REQUIREMENT

Description: A SAMPLING REQUIREMENT satisfies the conditions set by a SAP ELEMENT and specifies materials and QC needs.

Subject area: ENVIRONMENTAL_PROJECTS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 50 Growth Rate: 0% per year

Attributes: SMPL_RQMT_ID
Relationships:
Sometimes (0%) IS_SATISFIED_BY many INT_QC_SMPL_RQMT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Sometimes (0%) SPECIFIES one PRESERVATIVE
cannot transfer.
Always SPECIFIES one SMPL_CONT_TYPE
cannot transfer.
Always IS_SPECIFIED_FOR one SAP_ELEMENT
cannot transfer.

Identifiers:
<unnamed>
SMPL_RQMT_ID

Entity: SMPL_RSLT_QUAL

Description: A RESULT QUALIFIER associated with the SAMPLE RESULT.

Subject area: SAMPLE_RESULTS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: SMPL_RSLT_QUAL_DTE
Relationships:
Always IS_QUALIFICATION_OF one SAMPLE_RESULT
cannot transfer.
Always SPECIFIES one VALID_RSLT_QUAL
cannot transfer.

Identifiers:
SMPRSQ01 (Primary)
IS_QUALIFICATION_OF SAMPLE_RESULT
SPECIFIES VALID_RSLT_QUAL

Entity: SOW_METHOD

Description: A method for analysis called out in a STATEMENT OF WORK.

Subject area: ENVIRONMENTAL_PROJECTS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: SOW_METH_ID
Relationships:
Always IS_CALLED_OUT_BY one STATEMENT_OF_WORK
cannot transfer.

```
Sometimes (0%) CALLS_OUT many SOW_METH_PARAM
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
    cannot transfer.

Identifiers:
     <unnamed>  (Primary)
       SOW_METH_ID
       IS_CALLED_OUT_BY STATEMENT_OF_WORK



Entity:          SOW_METH_PARAM

Description:     A PARAMETER which is analyzed for a SOW METHOD.

Subject area:    ENVIRONMENTAL_PROJECTS

Properties:      Min Occ:          0 Avg Occ:          0
                 Max Occ:          0 Growth Rate:      0% per year

Attributes:      SOW_METH_PARAM_DTE
Relationships:
Always IS_CALLED_OUT_BY one SOW_METHOD
    cannot transfer.
Always CALLS_OUT one PARAMETER
    cannot transfer.
Sometimes (0%) IS_PART_OF one PARAM_ANALYSIS_GRP
    cannot transfer.

Identifiers:
     <unnamed>  (Primary)
       IS_CALLED_OUT_BY SOW_METHOD
       CALLS_OUT PARAMETER



Entity:          STATEMENT_OF_WORK

Description:     This contains information about the work to be
                 performed for a specific Environmental Project.
                 Information includes funding and tracking information
                 for the project.

Subject area:    ENVIRONMENTAL_PROJECTS

Properties:      Min Occ:          0 Avg Occ:          0
                 Max Occ:          0 Growth Rate:      0% per year

Attributes:      SOW_MAX_SMPL
                 SOW_FUND_AMT
                 SOW_PURCH_REQ_NO
                 SOW_CHARGE_NO
                 SOW_APO_NO
                 SOW_NO
Relationships:
Always IS_WRITTEN_FOR one ENV_PROJECT_TASK
    cannot transfer.
Always IS_WRITTEN_FOR one LAB
    cannot transfer.
Sometimes (0%) CALLS_OUT many SOW_METHOD
    Cardinality  Min: 1 (est) Max: 1 (est) Avg: 1
```

cannot transfer.

Identifiers:
<unnamed> (Primary)
SOW_NO
IS_WRITTEN_FOR ENV_PROJECT_TASK

Entity: TEAM_MEMBER_ROLE

Description: This entity defines all members of a MONITORING TEAM, the role(s) they have, and the COMPANY they work for while they are a part of the team.

Subject area: MONITORING_TEAMS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: TEAM_MEM_ROLE_DTE
Relationships:
Always BELONGS_TO one MONITORING_TEAM
cannot transfer.
Always PERFORMS one TEAM_ROLE
cannot transfer.
Always IS_EMPLOYED_BY one COMPANY
cannot transfer.
Always IS_COMPOSED_OF one BADGED_PERSON
cannot transfer.

Identifiers:
<unnamed> (Primary)
BELONGS_TO MONITORING_TEAM
PERFORMS TEAM_ROLE
IS_EMPLOYED_BY COMPANY
IS_COMPOSED_OF BADGED_PERSON

Entity: TEAM_ROLE

Description: Valid roles that MONITORING TEAM members may have.

Subject area: MONITORING_TEAMS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: TEAM_ROLE_NAM
TEAM_ROLE_CODE
Relationships:
Sometimes (0%) IS_PERFORMED_BY many TEAM_MEMBER_ROLE
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed> (Primary)
TEAM_ROLE_CODE

Entity: TEST_PARAM_QC_LIM
(LAB_TEST_COMP_ACCEPT_CRI)

Description: An indication for the LAB TEST and the type of QC being run, what value range is acceptable for the associated QC RESULT obtained. If the QC RESULT for a QC SAMPLE analyzed using the LAB TEST does not fall within the specified limits, the result is flagged and the SAMPLE RESULTS for both the QC SAMPLE and the associated customer SAMPLE(s) are considered questionable.

ALIAS: LAB TEST COMP ACCEPT CRI (ESLIMS)

Subject area: LABORATORY_TESTS

Properties:

Min Occ:	0	Avg Occ:	0
Max Occ:	3000	Growth Rate:	0% per year

Attributes:
TPQC_CRI_UNIT
TPQC_LOW_LIM_VAL
TPQC_UP_LIM_VAL

Relationships:
Always IS_DEFINED_FOR one LAB_TEST_PARAMETER
cannot transfer.
Always IS_DEFINED_FOR one QC_TYPE_COMPONENT
cannot transfer.

Identifiers:
CRI01 (Primary)
IS_DEFINED_FOR LAB_TEST_PARAMETER
IS_DEFINED_FOR QC_TYPE_COMPONENT

Entity: USGS_WEIR_FLOW

Description: FULL NAME: UNITED STATES GEOLOGICAL SURVEY WEIR FLOW

The accepted flow for a weir when the water level is at the height designated. The flow, provided by USGS, is an interpolation based upon flows measured for the weir by USGS.

SOURCE: EMMIS Project Units are not included with each flow measurement because they are always the same.

Subject area: MONITORING_LOCATIONS

Properties:

Min Occ:	0	Avg Occ:	0
Max Occ:	0	Growth Rate:	0% per year

Attributes:
WEIR_STD_FLOW_VAL
WEIR_FLOW_HGT_VAL
WEIR_FLOW_REC_DTE
WEIR_FLOW_REC_TIME
WEIR_FLOW_VERF_FLG
WEIR_FLOW_BADGE_NO

Relationships:
Always IS_FOR one MONIT_LOCATION
cannot transfer.

Identifiers:
<unnamed> (Primary)
WEIR_FLOW_HGT_VAL
IS_FOR MONIT_LOCATION

Entity: VALID_RSLT_QUAL

Description: An EPA or Laboratory Qualifier used to qualify results as below, within, or above range limits, specify special conditions concerning the analysis, Etc. An EPA qualifier is uppercase. A Laboratory Qualifier is lower case. (Ref: USEPA SOW Organics OLM01.0, Pages B-34 thru B-36; USEPA SOW Inorganics OLM01.0, Pages B-18 thru B-20.)

Subject area: SAMPLE_RESULTS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 50 Growth Rate: 0% per year

Attributes: VLD_RSLT_QUAL_TYP
VLD_RSLT_QUAL
VLS_RSLT_QUAL_DESC

Relationships:
Sometimes (0%) IS_SPECIFIED_AS many SMPL_RSLT_QUAL
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.

Identifiers:
<unnamed> (Primary)
VLD_RSLT_QUAL
VLD_RSLT_QUAL_TYP

Entity: WASTE_CODE

Description: A Standard Code used to describe the hazardous characteristics of Waste materials.

Subject area: WASTES

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: WASTE_CODE_ID
WASTE_CODE_DESC

Relationships:
Sometimes (0%) IS_SPECIFIED_AS many SAMPLE_WASTE_CODE
Cardinality Min: 0 (est) Max: 100000 (est) Avg: 1000
cannot transfer.

Identifiers:
WSTCDE01 (Primary)
WASTE_CODE_ID

Entity: WELL

Description: A well is installed to enable collection of groundwater samples and hydrologic data (i.e., water levels). There are two types of wells at the K-25 Site, monitoring wells and piezometers. Generally monitorng wells are constructed with 4- or 6-inch diameter stainless steel por PVC casing and screen. Piezometers are constructed with 2-inch diameter polyvinyl chloride casing and screen and are installed primarily to take water-level measurements.

Subject area: WELLS

Properties:

Min Occ:	0	Avg Occ:	0
Max Occ:	0	Growth Rate:	0% per year

Attributes:
WELL_USE
WELL_TRNSMSVTY
WELL_PERMIT_NO
WELL_ROCK_DPTH
WELL_INIT_WTR_DPTH
WELL_TYP
WELL_COMMENT
WELL_GROUT
WELL_CONSTR_DPTH
WELL_GEO_UNIT
WELL_UPRGT_MNT_FLG
WELL_AQUIFIER

Relationships:
Sometimes (0%) IS_PERMANENTLY_CLOSED_DURING one PLUGGING_EVENT
cannot transfer.
Always IS_A_TYPE_OF one MONIT_LOCATION
cannot transfer.
Always LOCATED_IN one GEOLOGIC_FORMATION
cannot transfer.

Identifiers:
<unnamed> (Primary)
IS_A_TYPE_OF MONIT_LOCATION

Entity: WELL_COMPONENT

Description: An structure which has been installed in a particular WELL. Examples include: screen, protective casing, well casing, surface casing, seal, or filter. This also includes information about the material used to construct the component.

Note: An either/or situation exists between WELL COMPONENT and WELL INSTALLATION EVENT or WELL MODIFICATION EVENT. Either the WELL INSTALLATION EVENT or the WELL MODIFICATION EVENT (but not both) can result in a WELL COMPONENT being installed in a WELL. For that reason, neither relationship is part of the identifier for WELL COMPONENT. The Well Event Identifier will contain the key of the event which resulted in the component being installed in the WELL.

Subject area: WELLS

Properties:
Min Occ:	0	Avg Occ:	0
Max Occ:	0	Growth Rate:	0% per year

Attributes:
WELL_COMP_EVT_ID
WELL_COMP_TOP_DPTH
WELL_COMP_BOT_DPTH
WELL_COMP_INS_DIAM
WELL_COMP_OUT_DIAM
WELL_COMP_SLOT_SIZ
WELL_COMP_MFG_NAM
WELL_COMP_REM_DTE

Relationships:
Sometimes (0%) INSTALLED_IN_WELL_BY one WELL_INSTALL_EVENT
cannot transfer.
Sometimes (0%) INSTALLED_BY one WELL_MOD_EVENT
cannot transfer.
Always AN_INSTALLED_OCCURRANCE_OF one COMP_TYP_MATERIAL
cannot transfer.

Identifiers:
<unnamed> (Primary)
WELL_COMP_EVT_ID
AN_INSTALLED_OCCURRANCE_OF COMP_TYP_MATERIAL

Entity: WELL_DEV_EVENT

Description: The process of removing fine-grained materials (e.g. silts, clays) from the filter pack and surrounding formation materials to restore natural hydraulic conditions, achieve good hydraulic communication between the monitoring well and natural formation, and enhance well yields. Methods may include overpumping with a submersible pump, bailing, or surging.

Subject area: WELLS

Properties:
Min Occ:	0	Avg Occ:	0
Max Occ:	0	Growth Rate:	0% per year

Attributes:
WELL_DEV_COMMENT
WELL_DEV_METH
WELL_DEV_END_DTE

Relationships:
Always IS_A_TYPE_OF one MONITORING_EVENT
cannot transfer.

Identifiers:
<unnamed> (Primary)
IS_A_TYPE_OF MONITORING_EVENT

Entity: WELL_INSTALL_EVENT

Description: An event initiated by Environmental Management personnel to construction a monitoring well or piezometer.

Subject area: WELLS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: WI_MEAS_ELEV
WI_EQUP_LOG_FLG
WI_COMMENT
WI_DEV_LOG_FLG
WI_COMPL_DTE
WI_CONST_CONTCTR

Relationships:
Sometimes (0%) INSTALLS_IN_WELL many WELL_COMPONENT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Always IS_A_TYPE_OF one MONITORING_EVENT
cannot transfer.
Sometimes (0%) REQUIRES one DRILLING_EVENT
cannot transfer.

Identifiers:
<unnamed> (Primary)
IS_A_TYPE_OF MONITORING_EVENT

Entity: WELL_MOD_EVENT

Description: An event intiated to modify the structure of a WELL. This includes changes to the surface structure, changes to the components of the WELL, or changes to the physical dimensions of the WELL.

Subject area: WELLS

Properties: Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes: WELL_MOD_ACT
WELL_MOD_COMPL_DTE
WELL_MOD_TYP
WELL_MOD_COMMENT
WELL_MOD_MEAS_ELEV

Relationships:
Sometimes (0%) INSTALLS_IN_WELL many WELL_COMPONENT
Cardinality Min: 1 (est) Max: 1 (est) Avg: 1
cannot transfer.
Always IS_A_TYPE_OF one MONITORING_EVENT
cannot transfer.

Identifiers:
<unnamed> (Primary)
IS_A_TYPE_OF MONITORING_EVENT

Entity: IEF_SUPPLIED

Description:

Subject area: WAG6

Properties:
Min Occ: 0 Avg Occ: 0
Max Occ: 0 Growth Rate: 0% per year

Attributes:
ACTION_ENTRY
COMMAND
COUNT
TOTAL_REAL
TOTAL_CURRENCY
TOTAL_INTEGER
PERCENTAGE
AVERAGE_REAL
AVERAGE_CURRENCY
AVERAGE_INTEGER
FLAG
SUBSCRIPT

-End of Report-

Appendix D

ATTRIBUTE DEFINITION REPORT

Appendix D contains the attribute definition report. Included in this report are the attribute names, their descriptions, their properties, their lengths, and their default values. They are listed by alphabetic order of the entity they are contained in.

Attribute Definition
Model : WAG6
Subset: (complete model)
Nov. 17, 1993 09:38

Attribute: ACT_LIM_CLOSED_DTE

Subject Area: LABORATORY_TESTS
Entity Type: ACTION_LIMIT

Description: The date when the LIMIT was no longer applicable.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: ACT_LIM_EFFECT_DTE

Subject Area: LABORATORY_TESTS
Entity Type: ACTION_LIMIT

Description: The date when the LIMIT became effective.

Properties: Mandatory Basic Date
Length: 8

Default: none

Attribute: ACT_LIM_UNIT

Subject Area: LABORATORY_TESTS
Entity Type: ACTION_LIMIT

Description: The standard abbreviation for the unit of measure in which the concentration limit value is expressed.

Properties: Mandatory Basic Text
Length: 8

Default: none

Attribute: ACT_LIM_VAL

Subject Area: LABORATORY_TESTS
Entity Type: ACTION_LIMIT

Description: The value representing the concentration level for a specific PARAMETER.

Note: IEF constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating points.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: AREA_GRP_NAM

Subject Area: MONITORING_LOCATIONS
Entity Type: AREA_GROUP

Description: The full name of the AREA GROUP.

Properties: Optional Basic Text
Length: 50

Default: none

Attribute: AREA_GRP_TYP

Subject Area: MONITORING_LOCATIONS
Entity Type: AREA_GROUP

Description: A type of group designation assigned to a collection of locations. For example: STOU, Site, WAG, OU.

Properties: Optional Basic Text
Length: 10

Default: none

Attribute: AREA_GRP_DESC

Subject Area: MONITORING_LOCATIONS
Entity Type: AREA_GROUP

Description: A textual description of the AREA GROUP.

Properties: Optional Basic Text
Length: 25

Default: none

Attribute: AREA_GRP_ID

Subject Area: MONITORING_LOCATIONS
Entity Type: AREA_GROUP

Description: A unique identifier for an AREA GROUP.

Properties: Mandatory Basic Text
Length: 9

Default: none

Attribute: AG_LOC_BEG_DTE

Subject Area: MONITORING_LOCATIONS
Entity Type: AREA_GRP_LOCATION

Description: The date the AREA GROUP was identified.

Properties: Mandatory Basic Date
Length: 8

Default: none

Attribute: AG_LOC_END_DTE

Subject Area: MONITORING_LOCATIONS
Entity Type: AREA_GRP_LOCATION

Description: The date the AREA GROUP became obsolete.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: AG_LOC_PURG_SEQ

Subject Area: MONITORING_LOCATIONS
Entity Type: AREA_GRP_LOCATION

Description: A number that indicates the order in which a group of wells must be purged.

Properties: Optional Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: BDGD_PRSN_UID

Subject Area: MONITORING_TEAMS
Entity Type: BADGED_PERSON

Description: The three-character user id of the person.

Properties: Optional Basic Text
Length: 3

Default: none

Attribute: BDGD_PRSN_LAST_NAM

Subject Area: MONITORING_TEAMS
Entity Type: BADGED_PERSON

Description: The last name of the person.

Properties: Mandatory Basic Text
Length: 20

Lefault: none

Attribute: BDGD_PRSN_MID_NAM

Subject Area: MONITORING_TEAMS
Entity Type: BADGED_PERSON

Description: The middle name of the person.

Properties: Optional Basic Text
Length: 15

Default: none

Attribute: BDGD_PRSN_FRST_NAM

Subject Area: MONITORING_TEAMS
Entity Type: BADGED_PERSON

Description: The first name of the person. (Need to check the length of this field)

Properties: Mandatory Basic Text
Length: 15

Default: none

Attribute: BDGD_PRSN_BADGE_NO

Subject Area: MONITORING_TEAMS
Entity Type: BADGED_PERSON

Description: The badge number of a person.

Properties: Mandatory Basic Text
Length: 6

Default: none

Attribute: BH_PERMIT_NO

Subject Area: BOREHOLES
Entity Type: BORE_HOLE

Description: The value of the permit number assigned for the BORE HOLE.

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: BH_ROCK_CORE_DESC

Subject Area: BOREHOLES
Entity Type: BORE_HOLE

Description: Description of boring rock core.

Properties: Optional Basic Text
Length: 25

Default: none

Attribute: BH_DRAW_NO

Subject Area: BOREHOLES
Entity Type: BORE_HOLE

Description: BORE HOLE drawing number.
**********Comments**********

Properties: Optional Basic Text
Length: 10

Default: none

Attribute: BH_RPT_NO

Subject Area: BOREHOLES
Entity Type: BORE_HOLE

Description: Report identifier associated with the BORE HOLE.

Properties: Optional Basic Text
Length: 15

Default: none

Attribute: BH_RPT_TITLE

Subject Area: BOREHOLES
Entity Type: BORE_HOLE

Description: Title of associated bore hole report.

Properties: Optional Basic Text
Length: 25

Default: none

Attribute: BH_RPT_DRAW_DTE

Subject Area: BOREHOLES
Entity Type: BORE_HOLE

Description: Date of associated bore hole report or drawing.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: BH_COMMENT

Subject Area: BOREHOLES
Entity Type: BORE_HOLE

Description: Comments or remarks on the purpose or construction of the BORE HOLE.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: BH_CONV_WELL_FLG

Subject Area: BOREHOLES
Entity Type: BORE_HOLE

Description: A flag that indicates whether a BORE HOLE was turned into a well. The default in 'N' for NO.

Properties: Mandatory Basic Text
Length: 1

Default Value: N

Permitted Values	
Y	Yes.
N	No.

Attribute: BH_DPTH

Subject Area: BOREHOLES
Entity Type: BORE_HOLE

Description: Total depth in feet of the BORE HOLE, relative to the ground surface.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 2

Default: none

Attribute: BH_ROCK_DPTH

Subject Area: BOREHOLES
Entity Type: BORE_HOLE

Description: Depth in feet to the top of the rock, relative to the ground surface.

Properties: Optional Basic Number
Length: 8 Decimal places: 2

Default: none

Attribute: BH_INIT_WTR_DPTH

Subject Area: BOREHOLES
Entity Type: BORE_HOLE

Description: Depth in feet from the ground surface to the ground water level at the time the BORE HOLE was drilled.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 2

Default: none

Attribute: BH_DIAM_UNIT

Subject Area: BOREHOLES
Entity Type: BORE_HOLE

Description: The standard unit of measure for reporting the diameter.

Properties: Mandatory Basic Text
Length: 8

Default: none

Attribute: BH_DIAM

Subject Area: BOREHOLES
Entity Type: BORE_HOLE

Description: Diameter in inches of the BORE HOLE.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 3

Default: none

Attribute: CO_NAM

Subject Area: MONITORING_TEAMS
Entity Type: COMPANY

Description: The descriptive name for the CO_CODE.

Properties: Mandatory Basic Text
Length: 50

Default: none

Attribute: CO_CODE

Subject Area: MONITORING_TEAMS
Entity Type: COMPANY

Description: The code used to identify the COMPANY.

Properties: Mandatory Basic Text
Length: 5

Default: none

Attribute: COMP_TYP_NAM

Subject Area: WELLS
Entity Type: COMPONENT_TYPE

Description: The full name of a particular type of component that can be part of a WELL.

Properties: Mandatory Basic Text
Length: 25

Default: none

Attribute: COMP_TYP_CODE

Subject Area: WELLS
Entity Type: COMPONENT_TYPE

Description: A code to indicate a particular type of component that is part of a well.

Properties: Mandatory Basic Text
Length: 4

Default: none

Attribute: COMP_MATL_NAM

Subject Area: WELLS
Entity Type: COMP_MATERIAL

Description: The full name of a material from which a well component can be constructed.

Properties: Mandatory Basic Text
Length: 25

Default: none

Attribute: COMP_MATL_CODE

Subject Area: WELLS
Entity Type: COMP_MATERIAL

Description: A code used to identify a material that can be used for various components of a well.

Properties: Mandatory Basic Text
Length: 4

Default: none

Attribute: COMP_TYP_MATL_DTE

Subject Area: WELLS
Entity Type: COMP_TYP_MATERIAL

Description: This attribute added for IEF Construction.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: FRM_DOC_MGT_CTL_NO

Subject Area: SAMPLES
Entity Type: DATA_FORM

Description: The unique identifier used by the Document Management Center to file the documents.

Properties: Optional Basic Text
Length: 10

Default: none

Attribute: FRM_TYP

Subject Area: SAMPLES
Entity Type: DATA_FORM

Description: The type of data form used to record information about a SAMPLE. Examples include the Sample Initiation Form, Sample Collection Form, Sample Processing Information Form, Field Logbook, etc.
**********Comments**********

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: FRM_NO

Subject Area: SAMPLES
Entity Type: DATA_FORM

Description: The number on the data form used to record information about a SAMPLE.

Properties: Mandatory Basic Number
Length: 15 Decimal places: 0

Default: none

Attribute: DATA_USE_QUAL_CODE

Subject Area: SAMPLE_RESULTS
Entity Type: DATA_USE_QUALIFIER

Description: A code that uniquely identifies a qualifier. This is equivalent to the Data Quality Level. It tells whatthe data can be used for, i.e. A, B, C, D.

Properties: Mandatory Basic Text
Length: 4

Default: none

Attribute: DATA_USE_QUAL_DESC

Subject Area: SAMPLE_RESULTS
Entity Type: DATA_USE_QUALIFIER

Description: A textual description of the DATA USABILITY QUALIFIER CODE.

Properties: Mandatory Basic Text
Length: 80

Default: none

Attribute: DATA_XFER_FILE_NAM

Subject Area: MONITORING_EVENTS
Entity Type: DATA_XFER_FILE

Description: The name of the file containing data from the electronic collection devices.

Properties: Mandatory Basic Text
Length: 20

Default: none

Attribute: DE_COMMENT

Subject Area: BOREHOLES
Entity Type: DRILLING_EVENT

Description: Any additional comments about the drilling event.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: DE_TOT_DEVIAT

Subject Area: BOREHOLES
Entity Type: DRILLING_EVENT

Description: The total deviation from vertical (in degrees) for the hole drilled during the DRILLING EVENT.

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: DE_DEVIAT_METH

Subject Area: BOREHOLES
Entity Type: DRILLING_EVENT

Description: The name of the method used to handle any deviations found during the drilling of the hole.

Properties: Mandatory Basic Text
Length: 30

Default: none

Attribute: DE_AUGR_REFSL_ELEV

Subject Area: BOREHOLES
Entity Type: DRILLING_EVENT

Description: Depth in feet at which an auger will not advance. Measured in feet below ground surface.

Properties: Optional Basic Number
Length: 8 Decimal places: 2

Default: none

Attribute: DE_GEO_LOG_FLG

Subject Area: BOREHOLES
Entity Type: DRILLING_EVENT

Description: A flag that indicates whether a geophysical log was used to document information about the BORE HOLE drilling.

Properties: Optional Basic Text
Length: 1

Default: none

Permitted Values

Y	Yes.
N	No.

Attribute: DE_CMPLT_DTE

Subject Area: BOREHOLES
Entity Type: DRILLING_EVENT

Description: The date the BORE HOLE drilling was completed.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: DE_EQUP_TYP

Subject Area: BOREHOLES
Entity Type: DRILLING_EVENT

Description: The type of equipment used to drill the BORE HOLE, for

example Rig.

Properties: Mandatory Basic Text
Length: 25

Default: none

Attribute: DE_EQUP_MAK

Subject Area: BOREHOLES
Entity Type: DRILLING_EVENT

Description: The make of the drilling equipment used during the drilling event.

Properties: Mandatory Basic Text
Length: 25

Default: none

Attribute: DE_GEO_CONTCTR

Subject Area: BOREHOLES
Entity Type: DRILLING_EVENT

Description: Name of the geophysical contractor present for the BORE HOLE construction.

Properties: Optional Basic Text
Length: 25

Default: none

Attribute: DE_CONTCTR

Subject Area: BOREHOLES
Entity Type: DRILLING_EVENT

Description: Contractor responsible for the construction of the BORE HOLE.

Properties: Optional Basic Text
Length: 25

Default: none

Attribute: DE_GEOGLST_NAM

Subject Area: BOREHOLES
Entity Type: DRILLING_EVENT

Description: Last name of the on-site geologist present when the BORE HOLE was constructed.

Properties: Optional Basic Text
Length: 25

Default: none

Attribute: DE_BEG_DTE

Subject Area: BOREHOLES
Entity Type: DRILLING_EVENT

Description: Date construction of a sampling or measuring location was started.

Properties: Mandatory Basic Date
Length: 8

Default: none

Attribute: DRILL_METH_DESC

Subject Area: BOREHOLES
Entity Type: DRILLING_METHOD

Description: The description of a process for drilling through soil or bedrock.

Properties: Mandatory Basic Text
Length: 80

Default: none

Attribute: DRILL_METH_CODE

Subject Area: BOREHOLES
Entity Type: DRILLING_METHOD

Description: The name of a particular process for drilling through soil or bedrock to construct a BORE HOLE. Leave blank for locations where no construction occurs.

Properties: Mandatory Basic Text
Length: 2

Default: none

Attribute: EMLF_MIN_RATE

Subject Area: MONITORING_LOCATIONS
Entity Type: ENV_MON_LOC_FLOW

Description: FULL NAME: Environmental Monitoring Location Minimum Flow Rate Value

The reported minimum flow rate at an ENVIRONMENTAL MONITORING LOCATION for a designated period of time. This value represents the minimum flow rate prior to being converted to the preferred ENVIRONMENTAL MEASUREMENT UNIT.

SOURCE:EMMIS Project
TYPE: BASIC

Note: IEF Constraint

This attribute shall be implemented as an ORACLE 'Number' to allow for floating points.

Properties: Optional Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: EMLF_MAX_RATE

Subject Area: MONITORING_LOCATIONS
Entity Type: ENV_MON_LOC_FLOW

Description: FULL NAME: Environmental Monitoring Location Maximum Flow Rate Value

The reported maximum flow rate at an ENVIRONMENTAL MONITORING LOCATION for a designated period of time. This value represents the maximum flow rate prior to being converted to the preferred ENVIRONMENTAL MEASUREMENT UNIT.

SOURCE: EMMIS Project
TYPE: BASIC

Note: IEF Constraint.
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating points.

Properties: Optional Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: EMLF_TIME

Subject Area: MONITORING_LOCATIONS
Entity Type: ENV_MON_LOC_FLOW

Description: FULL NAME: Environmental Monitoring Location Flow Time

The actual time that the flow rate for an ENVIRONMENTAL MONITORING LOCATION is measured.

SOURCE: EMMIS Project
TYPE: BASIC
The maximum per subject is set to 1 in order for it to be designated as part of the key to Env Monit Loc Flow. In fact, the time may not be recorded for every flow rate recorded. It would only be recorded for those flows that are measured instantaneously.

Properties: Mandatory Basic Number
Length: 4 Decimal places: 0

Default: none

Attribute: EMLF_RATE

Subject Area: MONITORING_LOCATIONS

Entity Type: ENV_MON_LOC_FLOW

Description: FULL NAME: Environmental Monitoring Location Flow Rate Value

A numerical value representing a measured or calculated rate of flow at an ENVIRONMENTAL MONITORING LOCATION. The value may be an actual flow rate measured instantaneously or an average flow rate for a period of time. This value represents the rate of flow as reported and prior to being converted to the preferred ENVIRONMENTAL MEASUREMENT UNIT.

SOURCE: EMMIS Project
TYPE: BASIC

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating points.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: EMLF_DTE

Subject Area: MONITORING_LOCATIONS
Entity Type: ENV_MON_LOC_FLOW

Description: FULL NAME: Environmental Monitoring Location Flow Date

The date for which an ENVIRONMENTAL MONITORING LOCATION FLOW applies.
SOURCE: EMMIS Project
TYPE: BASIC

Properties: Mandatory Basic Date
Length: 8

Default: none

Attribute: EMLF_CONV_MIN_RATE

Subject Area: MONITORING_LOCATIONS
Entity Type: ENV_MON_LOC_FLOW

Description: FULL NAME: Environmental Location Min Flow Rate Converted Value

The value of the Env Monit Loc Min Flow Rate Val after it has been converted to reflect the preferred ENVIRONMENTAL MEASUREMENT UNIT.

SOURCE: EMMIS Project
TYPE: DERIVED

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating points.

Properties: Optional Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: EMLF_CONV_MAX_RATE

Subject Area: MONITORING_LOCATIONS
Entity Type: ENV_MON_LOC_FLOW

Description: FULL NAME: Environmental Location Max Flow Rate Converted Value

The value of the Env Monit Loc Max Flow Rate Val after it has been converted to reflect the preferred ENVIRONMENTAL MEASUREMENT UNIT.

SOURCE: EMMIS Project
TYPE: DERIVED

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating points.

Properties: Optional Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: EMLF_METH_CODE

Subject Area: MONITORING_LOCATIONS
Entity Type: ENV_MON_LOC_FLOW

Description: FULL NAME: Environmental Location Flow Rate Method Code

The code indicating which flow rate method was used to measure or calculate the flow rate value at an ENVIRONMENTAL MONITORING LOCATION. Examples of methods used to measure or calculate flow rates are totalizer volumes, depth and velocity measurements, instantaneous measurement, USGS table look up, direct reporting from a monitoring location, Etc.

SOURCE: EMMIS
TYPE: DESIGNED

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: EMLF_CONV_RATE

Subject Area: MONITORING_LOCATIONS
Entity Type: ENV_MON_LOC_FLOW

Description: FULL NAME: Environmental Location Flow Rate Converted Value The value of the Env Monit Loc Flow Rate Val

after it has been converted to reflect the preferred ENVIRONMENTAL MEASUREMENT UNIT.

SOURCE: EMMIS Project
TYPE: DERIVED

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating points.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: EMLF_UNT_ABBR

Subject Area: MONITORING_LOCATIONS
Entity Type: ENV_MON_LOC_FLOW

Description: FULL NAME: Environmental Flow Rate Unit Abbreviation

The standard abbreviation for the ENVIRONMENTAL MEASUREMENT UNIT that the flow rate was expressed in prior to conversion.

SOURCE: EMMIS
TYPE: BASIC

Properties: Mandatory Basic Text
Length: 8

Default: none

Attribute: EMLF_CONV_UNT_ABBR

Subject Area: MONITORING_LOCATIONS
Entity Type: ENV_MON_LOC_FLOW

Description: FULL NAME: Environmental Flow Rate Converted Unit Abbreviation

The standard abbreviation for the ENVIRONMENTAL MEASUREMENT UNIT in which the converted flow rates are expressed.

SOURCE: EMMIS
TYPE: BASIC

Properties: Mandatory Basic Text
Length: 8

Default: none

Attribute: EP_COMMENT

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: ENV_PROJECT

Description: Comments or remarks concerning the project data.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: EP_SPON

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: ENV_PROJECT

Description: The organization responsible for data generation.

Properties: Mandatory Basic Text
Length: 50

Default: none

Attribute: EP_OU_ACRONYM

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: ENV_PROJECT

Description: The acronym for the Operable Unit.

Properties: Optional Basic Text
Length: 10

Default: none

Attribute: EP_ADS_NO

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: ENV_PROJECT

Description: The Activity Data Sheet number for the project.

Properties: Optional Basic Text
Length: 10

Default: none

Attribute: EP_ADS_NAM

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: ENV_PROJECT

Description: The Activity Data Sheet Name for the project.

Properties: Optional Basic Text
Length: 60

Default: none

Attribute: EP_RQMT_SRCE_ID

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: ENV_PROJECT

Description: The identifier for a regulatory or non-regulatory driver for which monitoring and site characterization is being performed. For example: RCRA, CERCLA, ES, ER.

Properties: Optional Basic Text
Length: 8

Default: none

Attribute: EP_NAM

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: ENV_PROJECT

Description: The name of the Project.

Properties: Mandatory Basic Text
Length: 100

Default: none

Attribute: EP_END_DTE

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: ENV_PROJECT

Description: Date project ended.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: EP_BEG_DTE

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: ENV_PROJECT

Description: The date when the groundwater monitoring project was started.

Properties: Mandatory Basic Date
Length: 8

Default: none

Attribute: EP_ID

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: ENV_PROJECT

Description: A unique project identifier, i.e. WAG6.

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: EP_DESC

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: ENV_PROJECT

Description: A textual description of a Project which may include details about the purpose of the project. This may be taken from the ORR Site Management Plan of the ER Program.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: ENV_PROJ_TASK_DESC

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: ENV_PROJECT_TASK

Description: The description of the ENV_PROJECT_TASK_CODE.

Properties: Mandatory Basic Text
Length: 80

Default: none

Attribute: ENV_PROJ_TASK_CODE

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: ENV_PROJECT_TASK

Description: A code used to identify a sub-project task. Examples include: NSS - Near-Shore Sampling AS - Arsenic Study P1.5 - Phase 1.5 etc.

Properties: Mandatory Basic Text
Length: 5

Default: none

Attribute: ENV_PROJ_TASK_DTE

Subject Area: MONITORING_LOCATIONS
Entity Type: ENV_PROJ_TASK_LOC

Description: This attribute added for IEF Construction.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: EQUP_CALB_COMMENT

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_CALB_EVENT

Description: Comments associated with the EQUP_CALB_EVENT.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: EQUP_CALB_SEQ_NO

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_CALB_EVENT

Description: A number used to sequence the calibration events for a piece of equipment on a given date.

Properties: Mandatory Basic Number
Length: 3 Decimal places: 0

Default: none

Attribute: EQUP_CALB_TYP

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_CALB_EVENT

Description: This indicates whether the calibration is an initial calibration or just a check.

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: EQUP_CALB_TIME

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_CALB_EVENT

Description: The time that equipment was calibrated.

Properties: Optional Basic Number
Length: 4 Decimal places: 0

Default: none

Attribute: EQUP_CALB_DTE

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_CALB_EVENT

Description: The date when the instrument was calibrated.

Properties: Mandatory Basic Date
Length: 8

Default: none

Attribute: EQUP_CALB_FRM_DTE

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_CALB_EVT_FRM

Description: This attribute added for IEF Construction.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: CALB_RSLT_COMMENT

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_CALB_RESULT

Description: Comments associated with the EQUIP CALIBRATION RESULT.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: EQUP_CALB_FLG

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_CALB_RESULT

Description: Flag used to indicate if the equipment passed (calibrated correctly without correction) or did not pass calibration.
Values are:
Y - The equipment passed calibration without correction.
N - The equipment had to be adjusted to reach the proper calibration.

Properties: Mandatory Basic Text
Length: 1

Default: none

Permitted Values

Y	Yes.
N	No.

Attribute: EQUP_CALB_TEMP

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_CALB_RESULT

Description: The temperature at which the FIELD INSTRUMENT was calibrated (i.e. in the room, in the field).

Note: IEF CONSTRAINT
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating points.

Properties: Optional Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: EQUP_CALB_PARAM

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_CALB_RESULT

Description: The parameter that is being calibrated. Examples include: pH7, ph10, etc.

Properties: Mandatory Basic Text
Length: 9

Default: none

Attribute: CALB_RSLT_SEQ_NO

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_CALB_RESULT

Description: A sequential number assigned to an EQUIPMENT CALIBRATION RESULT which in assocation with the EQUIPMENT CALIBRATION EVENT uniquely identifies the result.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: EQUP_CALB_UNIT

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_CALB_RESULT

Description: The standard measurement unit that the calibration result value was expressed in.

Properties: Mandatory Basic Text
Length: 8

Default: none

Attribute: EQUP_CALB_VAL

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_CALB_RESULT

Description: A number representing the numeric value of the calibration result.

Note: IEF Constraint

This attribute shall be implemented as an ORACLE 'Number' field to allow for floating points.

Properties: Mandatory Basic Number
Length: 18 Decimal places: 0

Default: none

Attribute: EQUP_INIT_FRM_DTE

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_INIT_EVT_FRM

Description: This attribute added for IEF construction.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: EQUP_INSP_COMMENT

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_INSP_EVENT

Description: Any comments associated with an EQUIP INSPECT EVENT.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: EQUP_INSP_DTE

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_INSP_EVENT

Description: The date that a piece of FIELD EQUIPMENT was inspected.

Properties: Mandatory Basic Date
Length: 8

Default: none

Attribute: EQUP_INSP_FRM_DTE

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_INSP_EVT_FRM

Description: This attribute added for IEF construction.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: EL_INIT_COMMENT

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_LOC_INIT_EVT

Description: Any comments associated with the EQUIP_LOC_END_DATE.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: EL_INIT_TIME

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_LOC_INIT_EVT

Description: The time that a piece of FIELD EQUIPMENT was initialized at a MONITORING LOCATION.

Properties: Mandatory Basic Number
Length: 4 Decimal places: 0

Default: none

Attribute: EL_INIT_DTE

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_LOC_INIT_EVT

Description: The date that a piece of FIELD EQUIPMENT is initialized at a MONITORING LOCATION.

Properties: Mandatory Basic Date
Length: 8

Default: none

Attribute: EL_REM_TIME

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_LOC_REM_EVENT

Description: The time a piece of FIELD EQUIPMENT was removed from a MONIT LOCATION.

Properties: Mandatory Basic Number
Length: 4 Decimal places: 0

Default: none

Attribute: EL_REM_COMMENT

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_LOC_REM_EVENT

Description: Comments associated with the EQUP LOC REM EVENT.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: EL_REM_DTE

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_LOC_REM_EVENT

Description: The date a piece of FIELD EQUIPMENT was removed from a MONIT LOCATION where it had previously been initialized.

Properties: Mandatory Basic Date
Length: 8

Default: none

Attribute: EQUP_REM_FRM_DTE

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_REM_EVT_FRM

Description: This attribute was added for IEF construction.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: EQUP_REPR_EVT_DTE

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_REPAIR_EVENT

Description: The date the repair event takes place for a piece of FIELD EQUIPMENT.

Properties: Mandatory Basic Date
Length: 8

Default: none

Attribute: EQUP_REPR_RET_DTE

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_REPAIR_EVENT

Description: The date that a piece of FIELD EQUIPMENT was returned after being repaired.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: EQUP_REPR_COMMENT

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_REPAIR_EVENT

Description: Any comments associated with an EQUIP_REPAIR_EVENT.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: EQUP_REPR_SND_DTE

Subject Area: FLD_EQUIPMENT
Entity Type: EQUP_REPAIR_EVENT

Description: The date that a piece of FIELD EQUIPMENT was sent off for repair.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: EXCEPT_EVT_DESC

Subject Area: MONITORING_EVENTS
Entity Type: EXCEPTION_EVENT

Description: Text used to describe an EXCEPTION EVENT.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: EXCEPT_EVT_YEAR

Subject Area: MONITORING_EVENTS
Entity Type: EXCEPTION_EVENT

Description: The calendar year when the EXCEPTION EVENT occurred.

Properties: Mandatory Basic Text
Length: 4

Default: none

Attribute: EXCEPT_EVT_NO

Subject Area: MONITORING_EVENTS
Entity Type: EXCEPTION_EVENT

Description: A sequential number assigned to an EXCEPTION EVENT which in association with the Exception Event Year and Exception Type uniquely identifies the event.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: EXCEPT_EVT_SEV_COD

Subject Area: MONITORING_EVENTS
Entity Type: EXCEPTION_EVENT

Description: A code indicating the severity of the EXCEPTION EVFNT in terms of whether it is a deviation, excursion, or violation.
Values =
"D": Deviation
"E": Excursion
"V": Violation

Properties: Mandatory Basic Text
Length: 10

Default: none

Permitted Values	
E	Excursion.
V	Violation.
D	Deviation.

Attribute: EXCEPT_EVT_DET_DTE

Subject Area: MONITORING_EVENTS
Entity Type: EXCEPTION_EVENT

Description: The date when the exception was detected.

Properties: Mandatory Basic Date
Length: 8

Default: none

Attribute: EQCS_EPA_ID

Subject Area: SAMPLES
Entity Type: EXTERNAL_QC_SAMPLE

Description: The identifier assigned to the standard or blank by the lab according to the EPA protocol. Only guaranteed to be unique within a sample delivery group.

Properties: Optional Basic Text
Length: 12

Default: none

Attribute: EQCS_QTY_UNIT

Subject Area: SAMPLES

Entity Type: EXTERNAL_QC_SAMPLE

Description: FULL NAME: SAMPLE QUANTITY UNIT

The unit of measure in which the SMPL QTY VAL is expressed.

Properties: Optional Basic Text
Length: 8

Default: none

Attribute: EQCS_QTY_VAL

Subject Area: SAMPLES
Entity Type: EXTERNAL_QC_SAMPLE

Description: FULL NAME: SAMPLE QUANTITY VALUE

A numeric value indicating the quantity of material used as the QC SAMPLE.

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating points.

Properties: Optional Basic Number
Length: 7 Decimal places: 3

Default: none

Attribute: EQCS_ID

Subject Area: SAMPLES
Entity Type: EXTERNAL_QC_SAMPLE

Description: FULL NAME: QUALITY CONTROL SAMPLE IDENTIFIER

The unique identifier given to the QC SAMPLE.

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: FIELD_COC_DTE

Subject Area: SAMPLES
Entity Type: FIELD_COC

Description: This attribute was added for IEF construction.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: EQUP_RETIRED_DTE

Subject Area: FLD_EQUIPMENT
Entity Type: FIELD_EQUIPMENT

Description: The date that a piece of FIELD EQUIPMENT was retired.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: EQUP_COMMENT

Subject Area: FLD_EQUIPMENT
Entity Type: FIELD_EQUIPMENT

Description: Comments associated with the FIELD EQUIPMENT.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: EQUP_MFG_NAM

Subject Area: FLD_EQUIPMENT
Entity Type: FIELD_EQUIPMENT

Description: The name of the manufacturer of the FIELD EQUIPMENT.

Properties: Mandatory Basic Text
Length: 40

Default: none

Attribute: EQUP_BEG_DTE

Subject Area: FLD_EQUIPMENT
Entity Type: FIELD_EQUIPMENT

Description: The date the piece of FIELD EQUIPMENT was entered into the system.

Properties: Mandatory Basic Date
Length: 8

Default: none

Attribute: EQUP_MODEL_NO

Subject Area: FLD_EQUIPMENT
Entity Type: FIELD_EQUIPMENT

Description: The model number of the FIELD EQUIPMENT.

Properties: Mandatory Basic Text
Length: 40

Default: none

Attribute: EQUP_TYP

Subject Area: FLD_EQUIPMENT
Entity Type: FIELD_EQUIPMENT

Description: A categorization of the FIELD EQUIPMENT. Examples include:
TELOG
HERMIT

Properties: Mandatory Basic Text
Length: 40

Default: none

Attribute: EQUP_STAT_CODE

Subject Area: FLD_EQUIPMENT
Entity Type: FIELD_EQUIPMENT

Description: A code used to indicate the availability of a piece of FIELD EQUIPMENT. Valid values include:

- Available for use
- In use
- Out of service temporarily
- Retired

Properties: Mandatory Basic Text
Length: 1

Default: none

Permitted Values	
A	Available for use.
O	Out of service.
I	In use.
R	Retired.

Attribute: EQUP_LAST_CALB_DTE

Subject Area: FLD_EQUIPMENT
Entity Type: FIELD_EQUIPMENT

Description: The date the equipment was last calibrated.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: EQUP_ID

Subject Area: FLD_EQUIPMENT
Entity Type: FIELD_EQUIPMENT

Description: The unique identifier for a piece of FIELD EQUIPMENT.

Properties: Mandatory Basic Text
Length: 9

Default: none

Attribute: EQUP_MFG_SER_NO

Subject Area: FLD_EQUIPMENT
Entity Type: FIELD_EQUIPMENT

Description: A series of numbers and/or characters assigned to a piece of FIELD EQUIPMENT by the manufacturer.

Properties: Mandatory Basic Text
Length: 40

Default: none

Attribute: FM_LOG_ID

Subject Area: MONITORING_EVENTS
Entity Type: FIELD_MEASUREMENT

Description: The identifier of the field logbook where the information about the collection of the FIELD MEASUREMENT is recorded.

Properties: Optional Basic Text
Length: 8

Default: none

Attribute: FM_LOG_BEG_PGE_NO

Subject Area: MONITORING_EVENTS
Entity Type: FIELD_MEASUREMENT

Description: The page number in the field logbook where the information about the collection of the FIELD MEASUREMENT begins.

Properties: Optional Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: FM_DATA_USE_QUAL

Subject Area: MONITORING_EVENTS
Entity Type: FIELD_MEASUREMENT

Description: This qualifier is equivalent to the Data Quality Level. It denotes what the data can be used for.

An example might be: A or I - H.P. Screening B or II - Characterization C or III - D or IV - Risk Assessment

Properties: Optional Basic Text
Length: 4

Default: none

Attribute: FM_RSLT_VALID_QUAL

Subject Area: MONITORING_EVENTS
Entity Type: FIELD_MEASUREMENT

Description: This qualifier is assigned by the data validator and qualifies the field results (the Fld Meas Result Qualifier.) If the validator agrees with the Fld Meas Result Qualifier, then this value will be the same. If a conversion needs to be made, the Fld Meas Result Qualifier will remain as it was originally assigned, and this qualifier will denote the converted value.

Properties: Optional Basic Text
Length: 4

Default: none

Attribute: FM_RSLT_QUAL

Subject Area: MONITORING_EVENTS
Entity Type: FIELD_MEASUREMENT

Description: This qualifier is assigned by the person in the field. Examples of values for this qualifier include less than a detection limit, estimated, J, U, B, etc.

Properties: Optional Basic Text
Length: 4

Default: none

Attribute: FM_DEPTH_UNIT

Subject Area: MONITORING_EVENTS
Entity Type: FIELD_MEASUREMENT

Description: The unit of measure for the Field Meas Depth.

Properties: Optional Basic Text
Length: 8

Default: none

Attribute: FM_DEPTH

Subject Area: MONITORING_EVENTS
Entity Type: FIELD_MEASUREMENT

Description: The depth at which a FIELD MEASUREMENT was taken.

Properties: Optional Basic Number
Length: 8 Decimal places: 2

Default: none

Attribute: FM_COMMENT

Subject Area: MONITORING_EVENTS
Entity Type: FIELD_MEASUREMENT

Description: The text associated with a FIELD MEASUREMENT.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: FM_DTE_COLL

Subject Area: MONITORING_EVENTS
Entity Type: FIELD_MEASUREMENT

Description: The date that a field measurement or observation was performed.

Properties: Mandatory Basic Date
Length: 8

Default: none

Attribute: FM_TIME_COLL

Subject Area: MONITORING_EVENTS
Entity Type: FIELD_MEASUREMENT

Description: The time that the field measurement or observation was performed.

Properties: Optional Basic Text
Length: 4

Default: none

Attribute: FM_RPT_RSLT

Subject Area: MONITORING_EVENTS
Entity Type: FIELD_MEASUREMENT

Description: A number representing the numeric value of a PARAMETER taken in the field.

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'number' field to allow for floating points.

Properties: Mandatory Basic Number

Length: 18 Decimal places: 0

Default: none

Attribute: FM_RPT_UNIT

Subject Area: MONITORING_EVENTS
Entity Type: FIELD_MEASUREMENT

Description: The standard measurement unit that the Reported Fld Meas Result is expressed in.

Properties: Mandatory Basic Text
Length: 8

Default: none

Attribute: FM_INIT_FNL_INDCTR

Subject Area: MONITORING_EVENTS
Entity Type: FIELD_MEASUREMENT

Description: A code that indicates whether the field measurement was the initial or final result taken during a MONITORING EVENT.

Valid values are:
"I" for initial
"F" for final

Properties: Optional Basic Text
Length: 1

Default: none

Permitted Values	
F	Final
I	Initial.

Attribute: FM_CONV_RPT_RSLT

Subject Area: MONITORING_EVENTS
Entity Type: FIELD_MEASUREMENT

Description: A value representing the conversion of the Reported Fld Meas to a value expressed in the preferred measurement unit.

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating points.

Properties: Optional Basic Number
Length: 18 Decimal places: 0

Default: none

Attribute: FM_CONV_UNIT

Subject Area: MONITORING_EVENTS
Entity Type: FIELD_MEASUREMENT

Description: The standard abbreviation for the preferred unit in which the Reported Fld Meas Value is expressed.

Properties: Optional Basic Text
Length: 8

Default: none

Attribute: FM_SEQ_NO

Subject Area: MONITORING_EVENTS
Entity Type: FIELD_MEASUREMENT

Description: A sequential number assigned to a FIELD MEASUREMENT which in association with the PARAMETER and MONITORING EVENT uniquely identifies the event.

Properties: Mandatory Basic Number
Length: 3 Decimal places: 0

Default: none

Attribute: FM_REVISED_FLG

Subject Area: MONITORING_EVENTS
Entity Type: FIELD_MEASUREMENT

Description: A flag that indicates whether the result has been revised. The default is "N" for NO.

Properties: Optional Basic Text
Length: 1

Default Value: N

Permitted Values	
N	No.
Y	Yes.

Attribute: FM_METH

Subject Area: MONITORING_EVENTS
Entity Type: FIELD_MEASUREMENT

Description: The identifier for the measurement method that was used to produce the FIELD MEASUREMENT.

This is equivalent to the Sum-Method attribute in the OREIS structure.

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: GEO_FORM_CODE

Subject Area: WELLS
Entity Type: GEOLOGIC_FORMATION

Description: A code assigned to identify a particular GEOLOGIC FORMATION.

Properties: Mandatory Basic Text
Length: 6

Default: none

Attribute: GEO_FORM_NAM

Subject Area: WELLS
Entity Type: GEOLOGIC_FORMATION

Description: The full name of a particular GEOLOGIC FORMATION.

Properties: Mandatory Basic Text
Length: 30

Default: none

Attribute: GEO_GRP_NAM

Subject Area: WELLS
Entity Type: GEOLOGIC_GROUP

Description: The full name of the geologic group.

Properties: Mandatory Basic Text
Length: 12

Default: none

Attribute: GEO_GRP_CODE

Subject Area: WELLS
Entity Type: GEOLOGIC_GROUP

Description: The unique identifier for the geologic code.

Properties: Mandatory Basic Text
Length: 6

Default: none

Attribute: GPSL_ID

Subject Area: MONITORING_LOCATIONS
Entity Type: GPS_LOCATION

Description: The unique identifier for a set of GPS coordinates.

Properties: Mandatory Basic Text
Length: 24

Default: none

Attribute: GPSL_ELLPS_STD_ERR

Subject Area: MONITORING_LOCATIONS
Entity Type: GPS_LOCATION

Description: The standard error of the ellipsoid height measurement recorded at a location on a particular date. This standard error value is recorded in meters.

Properties: Optional Basic Number
Length: 4 Decimal places: 3

Default: none

Attribute: GPSL_LONG_STD_ERR

Subject Area: MONITORING_LOCATIONS
Entity Type: GPS_LOCATION

Description: The standard error of the longitude measurement recorded at a location on a particular date. This standard error value is recorded in meters.

Properties: Optional Basic Number
Length: 4 Decimal places: 3

Default: none

Attribute: GPSL_LAT_STD_ERR

Subject Area: MONITORING_LOCATIONS
Entity Type: GPS_LOCATION

Description: The standard error of the latitude measurement recorded at a location on a particular date. This standard error value is recorded in meters.

Properties: Optional Basic Number
Length: 4 Decimal places: 3

Default: none

Attribute: GPSL_ELLPS_HGHT

Subject Area: MONITORING_LOCATIONS
Entity Type: GPS_LOCATION

Description: The height above or below the WGS 84 ellipsoid. GPS

uses the WGS84 ellipsoid model of the earth as the optimal mathematical model best describing the shape of the true earth at sea level based on an ellipsoid of revolution. This value is recorded in meters.

Properties: Optional Basic Number
Length: 6 Decimal places: 3

Default: none

Attribute: GPSL_LONGITUDE

Subject Area: MONITORING_LOCATIONS
Entity Type: GPS_LOCATION

Description: Geographic position of the location in degrees west of the equator. This must be in the format DDDMMSS.XXXX where DDD represents degrees, MM represents minutes, and SS.XXXX represents seconds.

Properties: Optional Basic Text
Length: 12

Default: none

Attribute: GPSL_LATITUDE

Subject Area: MONITORING_LOCATIONS
Entity Type: GPS_LOCATION

Description: Geographic position of the location in degrees north of the equator. This must be in the format DDDMMSS.XXXX where DDD represents degrees, MM represents minutes, and SS.XXXX represents seconds.

Properties: Optional Basic Text
Length: 12

Default: none

Attribute: HI_ACT_SOIL_RECV

Subject Area: BOREHOLES
Entity Type: HOLE_INTERVAL

Description: The actual amount of soil recovered from an interval.

Properties: Optional Basic Number
Length: 8 Decimal places: 2

Default: none

Attribute: HI_PLAN_SOIL_RECV

Subject Area: BOREHOLES
Entity Type: HOLE_INTERVAL

Description: the scheduled amount of soil to be recovered from the interval.

Properties: Optional Basic Number
Length: 8 Decimal places: 2

Default: none

Attribute: HI_ASTM_CODE

Subject Area: BOREHOLES
Entity Type: HOLE_INTERVAL

Description: This is the ASTM soil classification code used to classify unconsolidated deposits. See OREIS for a full list of valid codes. Examples include:
CH - Inorganic clays of high plasticity. Fat clays.
CL - Inorganic clays of lo to medium plasticity. Gravelly clay, sandy clay, silty clay.
SW - Well graded sands. Gravelly sands; little or no fines.
SP - Poorly graded sands. · Gravelly sands; little or no fines.
SM - Silty sands. Poorly graded sand-silt mixtures.
SC - Clayey sands. Poorly graded sand-clay mixtures.
PT - Peat and other highly organic soils.

Properties: Optional Basic Text
Length: 4

Default: none

Attribute: HI_DIAM_UNIT

Subject Area: BOREHOLES
Entity Type: HOLE_INTERVAL

Description: The standard unit of measure for reporting the diameter.

Properties: Mandatory Basic Text
Length: 8

Default: none

Attribute: HI_DIAM

Subject Area: BOREHOLES
Entity Type: HOLE_INTERVAL

Description: Diameter in inches of the BORE HOLE.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 3

Default: none

Attribute: HI_COMMENT

Subject Area: BOREHOLES
Entity Type: HOLE_INTERVAL

Description: Any additional comments about the HOLE INTERVAL or the material removed in that interval.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: HI_END_DPTH

Subject Area: BOREHOLES
Entity Type: HOLE_INTERVAL

Description: Lower depth in FEET of a lithologic stratum, measured below the ground surface.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 2

Default: none

Attribute: HI_BEG_DPTH

Subject Area: BOREHOLES
Entity Type: HOLE_INTERVAL

Description: Upper depth in FEET of a lithologic stratum, measured below the ground surface.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 2

Default: none

Attribute: HI_VSUAL_DESC

Subject Area: BOREHOLES
Entity Type: HOLE_INTERVAL

Description: The textual and mineralogical description of the materials found removed from a specific interval in a BORE HOLE.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: HOLE_INTV_CHAR_DTE

Subject Area: BOREHOLES
Entity Type: HOLE_INTERVAL_CHAR

Description: This attribute added for IEF Construction.

Properties: Optional Basic Date

Length: 8

Default: none

Attribute: INTV_CHAR_TYP_DESC

Subject Area: BOREHOLES
Entity Type: INTERVAL_CHAR_TYPE

Description: A textual description of the Interval Characteristic Type.

Properties: Mandatory Basic Text
Length: 80

Default: none

Attribute: INTV_CHAR_TYP_NAM

Subject Area: BOREHOLES
Entity Type: INTERVAL_CHAR_TYPE

Description: The full name of a material that can be found in a cutting removed from underground.

Properties: Mandatory Basic Text
Length: 50

Default: none

Attribute: INTV_CHAR_TYP_CODE

Subject Area: BOREHOLES
Entity Type: INTERVAL_CHAR_TYPE

Description: A code which uniquely identifies the type of material (sand, gravel, limestone, salt, etc.) found in a cutting removed from underground.

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: QC_SMPL_ORIG_CODE

Subject Area: SAMPLES
Entity Type: INT_QC_SAMPLE

Description: A code indicating the QC source type such as trip, lab, field, or wash of a QUALITY CONTROL SAMPLE.

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: INT_QC_RQMT_DTE

Subject Area: SAMPLES
Entity Type: INT_QC_SMPL_RQMT

Description: This attribute was added for IEF construction.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: KIT_PREP_DTE

Subject Area: SAMPLES
Entity Type: KIT

Description: The date that a KIT was prepared for use.
**********Comments**********

Properties: Mandatory Basic Date
Length: 8

Default: none

Attribute: KIT_ID

Subject Area: SAMPLES
Entity Type: KIT

Description: The unique identifier for a KIT.

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: LAB_ZIP_CODE

Subject Area: LABORATORIES
Entity Type: LAB

Description: Zip code for lab.

Properties: Optional Basic Number
Length: 9 Decimal places: 0

Default: none

Attribute: LAB_STATE

Subject Area: LABORATORIES
Entity Type: LAB

Description: Abbreviation of state in which lab is located.

Properties: Optional Basic Text
Length: 2

Default: none

Attribute: LAB_CITY

Subject Area: LABORATORIES
Entity Type: LAB

Description: Name of city in which lab is located.

Properties: Optional Basic Text
Length: 20

Default: none

Attribute: LAB_STREET

Subject Area: LABORATORIES
Entity Type: LAB

Description: Street address of lab.

Properties: Optional Basic Text
Length: 40

Default: none

Attribute: LAB_NAM

Subject Area: LABORATORIES
Entity Type: LAB

Description: The name of a LAB, identified by the Lab Code.

Properties: Mandatory Basic Text
Length: 50

Default: none

Attribute: LAB_CODE

Subject Area: LABORATORIES
Entity Type: LAB

Description: The unique identifier for a LAB.

Properties: Mandatory Basic Text
Length: 6

Default: none

Attribute: LAB_COC_DTE

Subject Area: SAMPLES
Entity Type: LAB_COC

Description: This attribute was added for IEF construction.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: LAB_CONT_PHONE

Subject Area: LABORATORIES
Entity Type: LAB_CONTACT

Description: Phone number of lab contact.

Properties: Mandatory Basic Number
Length: 10 Decimal places: 0

Default: none

Attribute: LAB_CONT_NAM

Subject Area: LABORATORIES
Entity Type: LAB_CONTACT

Description: Name of person at the lab who serves as contact point.

Properties: Mandatory Basic Text
Length: 30

Default: none

Attribute: LAB_INST_TYP

Subject Area: LABORATORIES
Entity Type: LAB_INSTRUMENT

Description: Type of instrument. For example AA furnace, AA flame, ICP, Spectograph, ect.

Properties: Mandatory Basic Text
Length: 12

Default: none

Attribute: LAB_INST_ID

Subject Area: LABORATORIES
Entity Type: LAB_INSTRUMENT

Description: Identifier used by the laboratory which must include some indication of the manufacturer and/or model of the instrument and contain additional characters that differentiate between all instruments of the same type in the lab.

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: LAB_INST_LAST_TIME

Subject Area: LABORATORIES
Entity Type: LAB_INST_CALB_EVT

Description: The time that the last standard for the instrument was calibrated (analyzed).

Properties: Mandatory Basic Number
Length: 4 Decimal places: 0

Default: none

Attribute: LAB_INST_LAST_DTE

Subject Area: LABORATORIES
Entity Type: LAB_INST_CALB_EVT

Description: The date when the last standard for the instrument was calibrated (analyzed).

Properties: Mandatory Basic Date
Length: 8

Default: none

Attribute: LAB_INST_CALB_CAT

Subject Area: LABORATORIES
Entity Type: LAB_INST_CALB_EVT

Description: Category of calibration being performed i.e., organic, semivols, vols, pesticide single component, pesticide multicomponent.

Properties: Mandatory Basic Text
Length: 25

Default: none

Attribute: LAB_INST_CONC_LVL

Subject Area: LABORATORIES
Entity Type: LAB_INST_CALB_EVT

Description: Concentration level of Pesticide Individual Mix A and B standards. Represents a low, mid, or high point.

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating points.

Properties: Optional Basic Number
Length: 5 Decimal places: 1

Default: none

Attribute: LAB_INST_GC_COL

Subject Area: LABORATORIES
Entity Type: LAB_INST_CALB_EVT

Description: Identifies the stationary phase of the gas chromatograph.

Properties: Optional Basic Text
Length: 10

Default: none

Attribute: LAB_INST_GC_COL_ID

Subject Area: LABORATORIES
Entity Type: LAB_INST_CALB_EVT

Description: Internal diameter in mm of the GC column for the instrument.

Properties: Optional Basic Number
Length: 4 Decimal places: 0

Default: none

Attribute: LAB_INST_CALB_FILE

Subject Area: LABORATORIES
Entity Type: LAB_INST_CALB_EVT

Description: Filename containing calibration results.

Properties: Mandatory Basic Text
Length: 14

Default: none

Attribute: LAB_INST_CALB_TYP

Subject Area: LABORATORIES
Entity Type: LAB_INST_CALB_EVT

Description: This indicates whether the calibration is an initial calibration or just a check.

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: LAB_INST_CALB_TIME

Subject Area: LABORATORIES
Entity Type: LAB_INST_CALB_EVT

Description: The time that the instrument was calibrated.

Note: if there is a INSTR_CALIB_LAST_TIME, then INSTR_CALIB_TIME is the time the first standard was analyzed

Properties: Mandatory Basic Number
Length: 4 Decimal places: 0

Default: none

Attribute: LAB_INST_CALB_DTE

Subject Area: LABORATORIES
Entity Type: LAB_INST_CALB_EVT

Description: The date when the instrument was calibrated.

Note: If there is a INSTR_CALIB_LAST_DATE, then INSTR_CALIB_DATE represents the date that the first standard was analyzed.

Properties: Mandatory Basic Date
Length: 8

Default: none

Attribute: INST_CALB_RSLT_SEQ

Subject Area: LABORATORIES
Entity Type: LAB_INST_CALB_RSLT

Description: Sequencer for calibration results.

Properties: Mandatory Basic Number
Length: 2 Decimal places: 0

Default: none

Attribute: INST_CALB_COMMENT

Subject Area: LABORATORIES
Entity Type: LAB_INST_CALB_RSLT

Description: Comments associated with the LAB INSTRUMENT CALIBRATION RESULT.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: INST_CALB_RSLT_TYP

Subject Area: LABORATORIES
Entity Type: LAB_INST_CALB_RSLT

Description: The type of calibration result: Examples RRF.

Properties: Mandatory Basic Text
Length: 9

Default: none

Attribute: INST_CALB_RSLT_UNT

Subject Area: LABORATORIES
Entity Type: LAB_INST_CALB_RSLT

Description: The standard measurement unit that the calibration result value was expressed in.

Properties: Mandatory Basic Text
Length: 8

Default: none

Attribute: INST_CALB_RSLT_VAL

Subject Area: LABORATORIES
Entity Type: LAB_INST_CALB_RSLT

Description: A number representing the numeric value of the calibration result.

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating points.

Properties: Mandatory Basic Number
Length: 18 Decimal places: 0

Default: none

Attribute: LAB_TST_ID

Subject Area: LABORATORY_TESTS
Entity Type: LAB_TEST

Description: Full Name: LABORATORY TEST IDENTIFIER
The identifier for a LAB TEST used within a Plant Laboratory. Since LAB TESTs are not standardized across Plant Laboratories, the LAB TEST ID coupled with the Analytical LAB ID uniquely identifies the LAB TEST.

Properties: Mandatory Basic Text
Length: 7

Default: none

Attribute: LAB_TST_NAM

Subject Area: LABORATORY_TESTS
Entity Type: LAB_TEST

Description: Full Name: LABORATORY TEST NAME

The full name for the LAB TEST.

Properties: Mandatory Basic Text
Length: 50

Default: none

Attribute: LAB_TST_TYP

Subject Area: LABORATORY_TESTS
Entity Type: LAB_TEST

Description: Full Name: LABORATORY TEST TYPE

An indication of whether the test is a preparation, extraction, analytical, or textual characterization test.

Properties: Mandatory Basic Text
Length: 1

Default: none

Permitted Values	
A	Analysis Test
E	Extraction
P	Preparation
T	Textual Characterization

Attribute: LAB_TST_HLD_FLG

Subject Area: LABORATORY_TESTS
Entity Type: LAB_TEST

Description: FULL NAME: HOLDING TIME FLAG

A flag indicating whether regulatory holding times apply to the LAB TEST.

Properties: Mandatory Basic Text
Length: 1

Default Value: Y

Permitted Values
Y
N

Attribute: LAB_TST_HLD_QTY

Subject Area: LABORATORY_TESTS
Entity Type: LAB_TEST

Description: FULL NAME: HOLDING TIME QUANTITY

A numeric value indicating the holding time for the LAB TEST. This Holding Time is specified only if regulatory holding times apply to the test and all ANALYTEs reported as part of the LAB TEST have the same holding time and the holding time is not matrix specific or the test is only specified for one matrix.

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating points.

Properties: Optional Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: LAB_TST_HLD_UNIT

Subject Area: LABORATORY_TESTS
Entity Type: LAB_TEST

Description: FULL NAME: HOLDING TIME UNIT

The unit of measure in which the HLD_TIME_QTY is expressed.

Properties: Optional Basic Text
Length: 8

Default: none

Attribute: LAB_MATRX_HLD_QTY

Subject Area: LABORATORY_TESTS
Entity Type: LAB_TEST_MATRIX

Description: FULL NAME: HOLDING TIME QUANTITY

A numeric value indicating the holding time for the LAB TEST matrix. This Holding Time is specified only if regulatory holding times apply to the test and all ANALYTEs reported as part of the LAB TEST have the same holding time for this matrix.

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating points.

Properties: Optional Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: LAB_MATRX_HLD_UNIT

Subject Area: LABORATORY_TESTS
Entity Type: LAB_TEST_MATRIX

Description: FULL NAME: HOLDING TIME UNIT

The unit of measure in which the HLD_TIME_QTY is expressed.

Properties: Optional Basic Text
Length: 8

Default: none

Attribute: LAB_MATRX_MIN_UNIT

Subject Area: LABORATORY_TESTS
Entity Type: LAB_TEST_MATRIX

Description: Unit of minimum sample required volume.

Properties: Mandatory Basic Text
Length: 2

Default: none

Attribute: LAB_MATRX_MIN_REQD

Subject Area: LABORATORY_TESTS
Entity Type: LAB_TEST_MATRIX

Description: Minimum volume of sample required by test for this matrix.

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating points.

Properties: Mandatory Basic Number
Length: 3 Decimal places: 0

Default: none

Attribute: LAB_MATRX_DEF_UNIT

Subject Area: LABORATORY_TESTS
Entity Type: LAB_TEST_MATRIX

Description: FULL NAME: DEFAULT UNIT

The unit of measure in which results for samples of the given MATRIX TYPE and analyzed using the given LAB TEST are by default expressed.

Properties: Optional Basic Text
Length: 8

Default: none

Attribute: LTP_EPA_METH

Subject Area: LABORATORY_TESTS

Entity Type: LAB_TEST_PARAMETER

Description: The method that governs a particular test for a particular PARAMETER.

Properties: Optional Basic Text
Length: 25

Default: none

Attribute: LTP_SURRGT_FLG

Subject Area: LABORATORY_TESTS
Entity Type: LAB_TEST_PARAMETER

Description: FULL NAME: SURROGATE FLAG

A flag indicating whether the ANALYTE is a surrogate for the specified test. Valid values are:

Y - The ANALYTE is a surrogate.
N - The ANALYTE is NOT a surrogate.

Properties: Mandatory Basic Text
Length: 1

Default: none

Permitted Values	
Y	Yes, it is a surrogate.
N	No is not a surrogate.

Attribute: LTP_HLD_UNIT

Subject Area: LABORATORY_TESTS
Entity Type: LAB_TEST_PARAMETER

Description: FULL NAME: HOLDING TIME UNIT

The unit of measure in which the HLD TIME QTY is expressed.

Properties: Optional Basic Text
Length: 8

Default: none

Attribute: LTP_HLD_QTY

Subject Area: LABORATORY_TESTS
Entity Type: LAB_TEST_PARAMETER

Description: FULL NAME: HOLDING TIME_QTY

A numeric value indicating, per the REGULATORY METHOD, the amount of time that may expire between either sample collection and initiation of analysis for the ANALYTE or between the initiation of the Preparation of the SAMPLE and the initiation of analysis for the ANALYTE. This holding time is entered only if the holding times for a LAB TEST vary dependent upon the ANALYTE.

Properties: Optional Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: LAB_TST_DET_LIM

Subject Area: LABORATORY_TESTS
Entity Type: LAB_TEST_PARAM_LIM

Description: Full Name: DETECTION LIMIT VALUE

The lower limit of the calibration range. The instrument is unable to detect any analyte value below this limit and therefore reports the result as < the detection limit.

Properties: Optional Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: LAB_TST_LOW_LIM

Subject Area: LABORATORY_TESTS
Entity Type: LAB_TEST_PARAM_LIM

Description: FULL NAME: LOWER REPORTING LIMIT VALUE

The lower limit of the region for which the method is good. This limit is determined statistically and is above the lower detection limit. Any anlyte value "detected" that is below this limit is flagged as estimated using the appropriate EPA Qualifier.

ALIAS: QUANTITATION LIMIT

Properties: Optional Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: LAB_TST_QUAL_CODE

Subject Area: LABORATORY_TESTS
Entity Type: LAB_TEST_QUAL

Description: FULL NAME: LABORATORY TEST QUALIFIER

A code indicating the qualifier which distinquishes between two runs of the same LAB TEST for the same

sample.

Examples of the qualifier are:
I - Initial
D - Disolved
T - Total
TR - Total Recoverable.

The requirements for sampling are dependent upon this qualifier.

Properties: Mandatory Basic Text
Length: 2

Default Value: N

Permitted Values	
N	None
TR	Total Recoverable
T	Total
I	Initial
D	Disolved

Attribute: LAB_TST_QUAL_DESC

Subject Area: LABORATORY_TESTS
Entity Type: LAB_TEST_QUAL

Description: FULL NAME: LABORATORY TEST QUALIFIER DESCRIPTION

The textual description corresponding to the Lab Test Qual, such as Dissolved for D.

Properties: Mandatory Basic Text
Length: 20

Default: none

Attribute: MATRX_TYP_USE_CODE

Subject Area: LABORATORY_TESTS
Entity Type: MATRIX_TYPE

Description: A code used to show whether a MATRIX TYPE is valid for a field sample, lab sample, or both.
Valid values are:
F - field
L - lab
B - both

Properties: Mandatory Basic Text
Length: 1

Default: none

Attribute: MATRX_TYP_DESC

Subject Area: LABORATORY_TESTS
Entity Type: MATRIX_TYPE

Description: FULL NAME: MATRIX TYPE DESCRIPTION

A textual description of the MATRIX TYPE.

Properties: Mandatory Basic Text
Length: 80

Default: none

Attribute: MATRX_TYP_CODE

Subject Area: LABORATORY_TESTS
Entity Type: MATRIX_TYPE

Description: FULL NAME: MATRIX TYPE CODE
A code which uniquely identifies a MATRIX TYPE.

Properties: Mandatory Basic Text
Length: 5

Default: none

Attribute: MEAS_UNIT_ABBR

Subject Area: SYSTEM_TABLES
Entity Type: MEASUREMENT_UNIT

Description: The standard abbreviation for an MEASUREMENT UNIT.

Properties: Mandatory Basic Text
Length: 8

Default: none

Attribute: MEAS_UNIT_NAM

Subject Area: SYSTEM_TABLES
Entity Type: MEASUREMENT_UNIT

Description: The full name of a MEASUREMENT UNIT.

Properties: Mandatory Basic Text
Length: 30

Default: none

Attribute: MUCF_PREF_UNT_ABBR

Subject Area: SYSTEM_TABLES
Entity Type: MEAS_UNIT_CONV_FAC

Description: The standard abbreviation for a MEASUREMENT UNIT whose use is preferred over the unit in which environmental results are reported.

SOURCE: EMMIS
TYPE: BASIC

Properties: Mandatory Basic Text
Length: 8

Default: none

Attribute: MUCF_RPT_UNIT_ABBR

Subject Area: SYSTEM_TABLES
Entity Type: MEAS_UNIT_CONV_FAC

Description: The standard abbreviation for a MEASUREMENT UNIT in which environmental results are often reported but for which there is another unit of measure that is preferred.

SOURCE: EMMIS
TYPE: BASIC

Properties: Mandatory Basic Text
Length: 8

Default: none

Attribute: MUCF_RSLT_VAL

Subject Area: SYSTEM_TABLES
Entity Type: MEAS_UNIT_CONV_FAC

Description: The unit value of the MEASUREMENT UNIT CONVERSION FACTOR which, in conjunction with the exponential value, is used to convert from one MEASUREMENT UNIT to another.

SOURCE: EMMIS
TYPE: BASIC

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for Floating Points.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: MUCF_RSLT_VAL_EXP

Subject Area: SYSTEM_TABLES

Entity Type: MEAS_UNIT_CONV_FAC

Description: The value of the exponential part of the MEASUREMENT UNIT CONVERSION FACTOR to be used in conjunction with the unit value to convert from one MEASUREMENT UNIT to another.

SOURCE: EMMIS
TYPE: BASIC

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating points.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: ME_DATA_FILE_DTE

Subject Area: MONITORING_EVENTS
Entity Type: ME_DATA_XFER_FILE

Description: This attribute was added for IEF construction.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: ME_END_TIME

Subject Area: MONITORING_EVENTS
Entity Type: MONITORING_EVENT

Description: The time the MONITORING EVENT ended.

Properties: Optional Basic Number
Length: 4 Decimal places: 0

Default: none

Attribute: ME_END_DTE

Subject Area: MONITORING_EVENTS
Entity Type: MONITORING_EVENT

Description: The date the MONITORING EVENT ended.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: ME_COMMENT

Subject Area: MONITORING_EVENTS
Entity Type: MONITORING_EVENT

Description: Remarks recorded about the MONITORING EVENT. This could include comments about visual observations.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: ME_SEQ_NO

Subject Area: MONITORING_EVENTS
Entity Type: MONITORING_EVENT

Description: The number assigned to a MONITORING EVENT which in conjunction with the start date and time makes the event unique.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: ME_WEATHER

Subject Area: MONITORING_EVENTS
Entity Type: MONITORING_EVENT

Description: Remarks or comments about the weather conditions during the sampling event.

Properties: Optional Basic Text
Length: 50

Default: none

Attribute: ME_BEG_TIME

Subject Area: MONITORING_EVENTS
Entity Type: MONITORING_EVENT

Description: The time the monitoring event started.

Properties: Optional Basic Number
Length: 4 Decimal places: 0

Default: none

Attribute: ME_BEG_DTE

Subject Area: MONITORING_EVENTS
Entity Type: MONITORING_EVENT

Description: The date the monitoring event started.
LIAS: Target Sample Date on Sample Initiation Form from the Clinch River Project.

Properties: Mandatory Basic Date
Length: 8

Default: none

Attribute: MONIT_TEAM_ID

Subject Area: MONITORING_TEAMS
Entity Type: MONITORING_TEAM

Description: The unique identifier for the MONITORING_TEAM.

Properties: Mandatory Basic Number
Length: 5 Decimal places: 0

Default: none

Attribute: MONIT_DATA_FRM_DTE

Subject Area: MONITORING_EVENTS
Entity Type: MONIT_EVT_DATA_FRM

Description: This attribute added for IEF construction.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: MONIT_FREQ_CODE

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: MONIT_FREQUENCY

Description: A code that uniquely identifies a frequency at which monitoring is to be performed.

Properties: Mandatory Basic Text
Length: 5

Default: none

Attribute: MONIT_FREQ_DESC

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: MONIT_FREQUENCY

Description: The description of the MONITORING FREQUENCY.

Properties: Mandatory Basic Text
Length: 80

Default: none

Attribute: ML_GPS_VAR_CODE

Subject Area: MONITORING_LOCATIONS
Entity Type: MONIT_LOCATION

Description: A code used to denote whether the GPS coordinates for a

location are fixed or will change for each MONITORING EVENT associated with the location. Values include:
F - Fixed (i.e. for a WELL)
V - Variable (i.e. for a location on a river)

Properties: Mandatory Basic Text
Length: 1

Default: none

Permitted Values

F
Fixed.

V
Variable.

Attribute: ML_MARKER_UNIT

Subject Area: MONITORING_LOCATIONS
Entity Type: MONIT_LOCATION

Description:

Properties: Optional Basic Text
Length: 8

Default: none

Attribute: ML_MARKER_NO

Subject Area: MONITORING_LOCATIONS
Entity Type: MONIT_LOCATION

Description:

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating points.

Properties: Optional Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: ML_NAM

Subject Area: MONITORING_LOCATIONS
Entity Type: MONIT_LOCATION

Description: A name which is commonly used to identify a MONITORING LOCATION. This is not the unique identifier for a MONITORING LOCATION.

Properties: Optional Basic Text
Length: 9

Default: none

Attribute: ML_STAT_CODE

Subject Area: MONITORING_LOCATIONS
Entity Type: MONIT_LOCATION

Description: This designates the current status of a MONITORING LOCATION. Examples include active, inactive, plugged well, etc.

Properties: Optional Basic Text
Length: 2

Default: none

Attribute: ML_MEAS_ERR

Subject Area: MONITORING_LOCATIONS
Entity Type: MONIT_LOCATION

Description: This designates the error of measurement for a given Monit Loc Id Method Code, i.e., the Monit Loc Id Method Code is correct to within a tenth of a foot. The units for this value are known through the Grid System attribute.

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating point values.

Properties: Optional Basic Number
Length: 8 Decimal places: 2

Default: none

Attribute: ML_MEAS_METH

Subject Area: MONITORING_LOCATIONS
Entity Type: MONIT_LOCATION

Description: FULL NAME: Monitoring Location

Identification Method Code A coded value used to identify the method used to identify a MONITORING LOCATION. Examples include a survey, an approximation from a map, etc.

Properties: Optional Basic Text
Length: 10

Default: none

Attribute: ML_ELEV_MEAS_METH

Subject Area: MONITORING_LOCATIONS
Entity Type: MONIT_LOCATION

Description: This attribute may exist for locations which are not defined by GPS. A coded value identifying the

elevation measurement method.

Properties: Optional Basic Text
Length: 10

Default: none

Attribute: ML_ELEV_MEAS_ERR

Subject Area: MONITORING_LOCATIONS
Entity Type: MONIT_LOCATION

Description: This attribute may exist for locations which are not defined by GPS. Elevation measurement error, in feet.

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating point value.

Properties: Optional Basic Number
Length: 8 Decimal places: 2

Default: none

Attribute: ML_NORTHING

Subject Area: MONITORING_LOCATIONS
Entity Type: MONIT_LOCATION

Description: This attribute may exist for locations which are not defined by GPS. The y-value (North-South) of the distance in feet of a sampling or measuring location from the reference location of known state plane coordinates.

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allaow for floating point values.

Properties: Optional Basic Number
Length: 8 Decimal places: 2

Default: none

Attribute: ML_EASTING

Subject Area: MONITORING_LOCATIONS
Entity Type: MONIT_LOCATION

Description: This attribute may exist for locations which are not defined by GPS. The x-value (East-West) of the distance in feet of a sampling or measuring location from the reference location of known state plane coordinates.

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating points.

Properties: Optional Basic Number

Length: 8 Decimal places: 2

Default: none

Attribute: ML_GND_ELEV

Subject Area: MONITORING_LOCATIONS
Entity Type: MONIT_LOCATION

Description: This attribute may exist for locations which are not defined by GPS. Elevation of ground surface (for groundwater, soil, or sediment sampling) at a sampling or measuring location in feet above mean sea level (msl). This is mandatory if the monitoring location is for groundwater. For groundwater sampling locations, use the elevation of the land surface.

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating point values.

Properties: Optional Basic Number
Length: 8 Decimal places: 2

Default: none

Attribute: ML_COMMENT

Subject Area: MONITORING_LOCATIONS
Entity Type: MONIT_LOCATION

Description: The text associated with a MONITORING LOCATION.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: ML_GRID_SYS

Subject Area: MONITORING_LOCATIONS
Entity Type: MONIT_LOCATION

Description: This attribute may exist for locations which are not defined by GPS. Coordinate grid system which defines the units used for EASTING and NORTHING.

Properties: Optional Basic Text
Length: 10

Default: none

Attribute: ML_DESC

Subject Area: MONITORING_LOCATIONS
Entity Type: MONIT_LOCATION

Description: Description of the specific sampling or measuring location.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: ML_TYP

Subject Area: MONITORING_LOCATIONS
Entity Type: MONIT_LOCATION

Description: The type of location where measurements are taken (ex: spring, seep, well, borehole).

Properties: Optional Basic Text
Length: 2

Default: none

Attribute: ML_ID

Subject Area: MONITORING_LOCATIONS
Entity Type: MONIT_LOCATION

Description: Unique identifier assigned to a specific location where measurements or samples are taken (well number, borehole number, etc.).

Properties: Mandatory Basic Text
Length: 9

Default: none

Attribute: MLA_BEG_DTE

Subject Area: MONITORING_LOCATIONS
Entity Type: MONIT_LOC_ALIAS

Description: The date when the Alias name was effective.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: MLA_NAM

Subject Area: MONITORING_LOCATIONS
Entity Type: MONIT_LOC_ALIAS

Description: The name or description of a former location

Properties: Mandatory Basic Text
Length: 9

Default: none

Attribute: MLA_ID

Subject Area: MONITORING_LOCATIONS
Entity Type: MONIT_LOC_ALIAS

Description: Former identification number of a MONITORING LOCATION,

Properties: Mandatory Basic Text
Length: 9

Default: none

Attribute: MLSP_COMMENT

Subject Area: MONITORING_LOCATIONS
Entity Type: MONIT_LOC_SRVC_PER

Description: Comments recorded about when the MONITORING LOCATION is taken in and out of service.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: MLSP_END_DTE

Subject Area: MONITORING_LOCATIONS
Entity Type: MONIT_LOC_SRVC_PER

Description: The date that monitoring was ended at the MONITORING LOCATION.

SOURCE: EMMIS
TYPE: BASIC

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: MLSP_BEG_DTE

Subject Area: MONITORING_LOCATIONS
Entity Type: MONIT_LOC_SRVC_PER

Description: The date that monitoring was begun at a particular MONITORING LOCATION.

SOURCE: EMMIS
TYPE: BASIC

Properties: Mandatory Basic Date
Length: 8

Default: none

Attribute: PARAM_CODE

Subject Area: LABORATORY_TESTS

Entity Type: PARAMETER

Description: The unique identifier for a PARAMETER. If the PARAMETER has a valid CAS Id, then the Parameter Code and the Parameter CAS Id will be the same.

Properties: Mandatory Basic Text
Length: 9

Default: none

Attribute: PARAM_ABBR

Subject Area: LABORATORY_TESTS
Entity Type: PARAMETER

Description: The standard abbreviation for the PARAMETER.
SOURCE: EMMIS
TYPE: BASIC

Properties: Optional Basic Text
Length: 5

Default: none

Attribute: PARAM_CAS_ID

Subject Area: LABORATORY_TESTS
Entity Type: PARAMETER

Description: The Chemical Abstract Services Number that is used throughout industry as a standard identifier for a PARAMETER. The CAS identifier is defined primarily for chemical elements and compounds. Currently, not every PARAMETER has a CAS Id; however, the Common Lab Practices team is assigning CAS numbers to PARAMETERs that have no number so that every PARAMETER will have a CAS Id.

Properties: Optional Basic Text
Length: 12

Default: none

Attribute: PARAM_STD_NAM

Subject Area: LABORATORY_TESTS
Entity Type: PARAMETER

Description: The standard full name for the PARAMETER. For CAS numbers, this is the preferred name defined by the PIP committee.

Properties: Mandatory Basic Text
Length: 50

Default: none

Attribute: PARAM_ANLY_CAT_NAM

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: PARAM_ANALYSIS_CAT

Description: The descriptive name for a Param Analysis Cat Code.

Properties: Mandatory Basic Text
Length: 80

Default: none

Attribute: PARAM_ANLY_CAT_COD

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: PARAM_ANALYSIS_CAT

Description: A code which uniquely identifies a PARAMETER ANALYSIS CATEGORY.

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: PARAM_ANLY_GRP_NAM

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: PARAM_ANALYSIS_GRP

Description: The descriptive name for a Param Analysis Group Code.

Properties: Mandatory Basic Text
Length: 80

Default: none

Attribute: PARAM_ANLY_GRP_COD

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: PARAM_ANALYSIS_GRP

Description: A code which uniquely identifies a PARAMETER ANALYSIS GROUP.

Properties: Mandatory Basic Text
Length: 6

Default: none

Attribute: PLUG_EVT_LOC_ID

Subject Area: WELLS
Entity Type: PLUGGING_EVENT

Description: Unique identifier assigned to a specific location where samples are taken (well number, bore hole number, etc.).

NOTE: On this entity, the Location Id actually comes

from the relationship to the WELL or the BORE HOLE. Since we were not sure about how to denote optional keys on the model, we just added this as an attribute in order to make it part of the identifier for this entity.

Properties: Mandatory Basic Text
Length: 9

Default: none

Attribute: PLUG_EVT_DTE

Subject Area: WELLS
Entity Type: PLUGGING_EVENT

Description: The date that a WELL or a BORE HOLE was plugged.

Properties: Mandatory Basic Date
Length: 8

Default: none

Attribute: PLUG_METH_NAM

Subject Area: WELLS
Entity Type: PLUGGING_METHOD

Description: The name of a particular process that can be used to plug a WELL or BORE HOLE.

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: PLUG_METH_DESC

Subject Area: WELLS
Entity Type: PLUGGING_METHOD

Description: The textual description of a process that can be used to plug a WELL or BORE HOLE.

Properties: Mandatory Basic Text
Length: 80

Default: none

Attribute: PLUG_INTV_END_DPTH

Subject Area: WELLS
Entity Type: PLUG_INTV_MATERIAL

Description: The depth in feet (from gound surface) at which the use of a material ended, indicating the start of a new interval in the plugged WELL or BORE HOLE.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 2

Default: none

Attribute: PLUG_INTV_BEG_DPTH

Subject Area: WELLS
Entity Type: PLUG_INTV_MATERIAL

Description: The depth in feet (from ground surface) at which the use of particular plugging material to plug the WELL or BORE HOLE started.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 2

Default: none

Attribute: PLUG_MATL_NAM

Subject Area: WELLS
Entity Type: PLUG_MATERIAL

Description: The full name of the material used to plug a well or bore hole.

Properties: Mandatory Basic Text
Length: 30

Default: none

Attribute: PLUG_MATL_CODE

Subject Area: WELLS
Entity Type: PLUG_MATERIAL

Description: The unique identifer of a material used to plug a well or bore hole.

Properties: Mandatory Basic Text
Length: 4

Default: none

Attribute: PRESERVATIVE_NAM

Subject Area: SAMPLES
Entity Type: PRESERVATIVE

Description: The name of preservative used to maintain a SAMPLE.

Properties: Mandatory Basic Text
Length: 50

Default: none

Attribute: PRESERVATIVE_CODE

Subject Area: SAMPLES
Entity Type: PRESERVATIVE

Description: A code identifying a preservative which may be used to maintain a SAMPLE. Example: H2SO4 - Sulfuric Acid

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: PT_ANLY_MATRX_DTE

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: PT_ANLY_CAT_MATRIX

Description: This attribute added for IEF Construction.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: PURG_EVT_WTR_DISP

Subject Area: MONITORING_EVENTS
Entity Type: PURGE_EVENT

Description: The final destination of the purge water. Examples include CNF, ground, Held for Sampling, Containerized, etc.

Properties: Optional Basic Text
Length: 10

Default: none

Attribute: PURG_EVT_SEQ_NO

Subject Area: MONITORING_EVENTS
Entity Type: PURGE_EVENT

Description: A number used to sequence the PURGE EVENTs for a MONITORING EVENT.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: PURG_EVT_VOL_UNIT

Subject Area: MONITORING_EVENTS
Entity Type: PURGE_EVENT

Description: The unit of measure specified for the Purged Volume.

Properties: Mandatory Basic Text

Length: 8

Default: none

Attribute: PURG_EVT_PURG_VOL

Subject Area: MONITORING_EVENTS
Entity Type: PURGE_EVENT

Description: The volume of water removed from the well during the PURGE EVENT.

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating points.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: PURG_EVT_TIME

Subject Area: MONITORING_EVENTS
Entity Type: PURGE_EVENT

Description: The time the well was purged, format HH:MM.

Properties: Mandatory Basic Number
Length: 4 Decimal places: 0

Default: none

Attribute: PU _DESC

Subject Area: MONITORING_EVENTS
Entity Type: PURGE_METHOD

Description: A text description for the Purge Method Code.

Properties: Mandatory Basic Text
Length: 80

Default: none

Attribute: PURG_METH_CODE

Subject Area: MONITORING_EVENTS
Entity Type: PURGE_METHOD

Description: A code uniquely identifying a PURGE METHOD.

Properties: Mandatory Basic Text
Length: 2

Default: none

Attribute: QCA_LOW_QUAL_LIM

Subject Area: SAMPLES
Entity Type: QC_ANALYTE

Description: FULL NAME: LOWER QUALIFICATION LIMIT VALUE

The lowest value which can be obtained for an External QC Sample that references the given EXT QC MATERIAL and the result be considered within acceptable range of the actual value. If this value is not entered, the confidence level based upon the precision percentage for the associated LAB TEST COMPONENT should be used to determine whether the result is within an acceptable range.

Note: IEF Constraint
This attribute shall be implementation as an ORACLE 'Number' field to allow for floating point values.

Properties: Optional Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: QCA_UP_QUAL_LIM

Subject Area: SAMPLES
Entity Type: QC_ANALYTE

Description: FULL NAME: UPPER QUALIFICATION LIMIT VALUE

The highest value which can be obtained for an External QC Sample that references the given EXT QC MATERIAL and the result be considered within an acceptable range of the known value for the ANALYTE. If this value is not entered the confidence level base upon the precision percentage for the associated LAB TEST COMPONENT should be used to determine whether the result is within an acceptable range.

Note: IEF Constraints
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating points.

Properties: Optional Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: QCA_CONC_UNIT

Subject Area: SAMPLES
Entity Type: QC_ANALYTE

Description: FULL NAME: CONCENTRATION UNIT

The unit of measure in which the EXTERNAL QC ANALYTE CONC VAL is expressed.

Properties: Mandatory Basic Text
Length: 8

Default: none

Attribute: QCA_CONC_VAL

Subject Area: SAMPLES
Entity Type: QC_ANALYTE

Description: FULL NAME: CONCENTRATION VALUE

A numeric value indicating the known concentration of the ANALYTE in the External QC Sample.

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating points.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: QC_MATL_DESC

Subject Area: SAMPLES
Entity Type: QC_MATERIAL

Description: FULL NAME: QUALITY CONTROL MATERIAL DESCRIPTION

A textual description of the QC MATERIAL.

Properties: Optional Basic Text
Length: 80

Default: none

Attribute: QC_MATL_ID

Subject Area: SAMPLES
Entity Type: QC_MATERIAL

Description: FULL NAME: QUALITY CONTROL MATERIAL IDENTIFIER

The unique identifier for the QC MATERIAL.

Properties: Mandatory Basic Text
Length: 20

Default: none

Attribute: QC_RSLT_UNIT

Subject Area: SAMPLE_RESULTS
Entity Type: QC_RESULT

Description: The unit of measure in which the QC RESULT is expressed.

Properties: Mandatory Basic Text

Length: 10

Default: none

Attribute: QC_RSLT_VAL

Subject Area: SAMPLE_RESULTS
Entity Type: QC_RESULT

Description: The result in decimal form.

Note: IEF Constraints
1. This attribute shall be implemented as an ORACLE 'Number' field to allow for floating point values.

Properties: Optional Basic Number
Length: 18 Decimal places: 0

Default: none

Attribute: QC_RSLT_DESC

Subject Area: SAMPLE_RESULTS
Entity Type: QC_RESULT

Description: The result as entered in textual form.

Properties: Optional Basic Text
Length: 10

Default: none

Attribute: QCS_FNL_QTY_UNIT

Subject Area: QC_TYPES
Entity Type: QC_SMPL_REF_MATL

Description: FULL NAME: FINAL SAMPLE QUANTITY UNIT

The unit of measure in which the Final Sample Quantity is expressed.

Properties: Mandatory Basic Text
Length: 8

Default: none

Attribute: QCS_FNL_QTY

Subject Area: QC_TYPES
Entity Type: QC_SMPL_REF_MATL

Description: FULL NAME: FINAL SAMPLE QUANTITY

The final quantity in volume or weight of the SAMPLE after addition of the REFERENCE MATERIAL.

Note: IEF Constraint
This attribute shall be implemented as an ORACLE

'Number' field to allow for floating point values.

Properties: Optional Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: QCS_ADD_QTY_UNIT

Subject Area: QC_TYPES
Entity Type: QC_SMPL_REF_MATL

Description: FULL NAME: ADDED QUANTITY UNIT

The unit of measure in which the ADD QTY VAL is expressed.

Properties: Optional Basic Text
Length: 8

Default: none

Attribute: QCS_ADD_QTY_VAL

Subject Area: QC_TYPES
Entity Type: QC_SMPL_REF_MATL

Description: FULL NAME: ADDED QUANTITY VALUE

A numeric value indicating the quantity of REFERENCE MATERIAL that was used in the QC SAMPLE.

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating point values.

Properties: Optional Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: QCT_INT_EXT_CODE

Subject Area: QC_TYPES
Entity Type: QC_TYPE

Description: A code used to show whether a Matrx Type Code is valid for internal or external QC samples, or both.
Valid values:
I - Internal
E - External
B - Both

Properties: Mandatory Basic Text
Length: 1

Default: none

Permitted Values

I
Internal only.

E
External only.

B
Both internal and External.

Attribute: QCT_NAM

Subject Area: QC_TYPES
Entity Type: QC_TYPE

Description: FULL NAME: QUALITY CONTROL TYPE NAME

The full name for the QC TYPE.

Properties: Mandatory Basic Text
Length: 50

Default: none

Attribute: QCT_CODE

Subject Area: QC_TYPES
Entity Type: QC_TYPE

Description: FULL NAME: QUALITY CONTROL TYPE CODE

A code which uniquely identifies the QUALITY CONTROL TYPE.

Properties: Mandatory Basic Text
Length: 15

Default: none

Attribute: QCTC_SIG_DIGIT_QTY

Subject Area: QC_TYPES
Entity Type: QC_TYPE_COMPONENT

Description:

Properties: Mandatory Basic Number
Length: 6 Decimal places: 0

Default: none

Attribute: QCTC_DEF_UNIT

Subject Area: QC_TYPES
Entity Type: QC_TYPE_COMPONENT

Description:

Properties: Mandatory Basic Text

Length: 8

Default: none

Attribute: QCTC_VAL_FORMAT

Subject Area: QC_TYPES
Entity Type: QC_TYPE_COMPONENT

Description:

Properties: Mandatory Basic Text
Length: 20

Default: none

Attribute: QCTC_VAL_LEN

Subject Area: QC_TYPES
Entity Type: QC_TYPE_COMPONENT

Description:

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating points.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: QCTC_VAL_TYP

Subject Area: QC_TYPES
Entity Type: QC_TYPE_COMPONENT

Description:

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: QCTC_NAM

Subject Area: QC_TYPES
Entity Type: QC_TYPE_COMPONENT

Description:

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: REF_MATL_DESC

Subject Area: QC_TYPES
Entity Type: REFERENCE_MATERIAL

Description: FULL NAME: REFERENCE MATERIAL DESCRIPTION

The general description of the REFERENCE MATERIAL. For example, 1000 ppm Hg.

Properties: Optional Basic Text
Length: 40

Default: none

Attribute: REF_MATL_NO

Subject Area: QC_TYPES
Entity Type: REFERENCE_MATERIAL

Description: FULL NAME: REFERENCE MATERIAL NUMBER

The identifying number given to the REFERENCE MATERIAL within the laboratory.

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: RMA_CONC_UNIT

Subject Area: QC_TYPES
Entity Type: REF_MATL_ANALYTE

Description: FULL NAME: CONCENTRATION UNIT

The unit of measure in which the REFERENCE MATERIAL ANALYTE CONC VAL is expressed.

Properties: Mandatory Basic Text
Length: 8

Default: none

Attribute: RMA_CONC_VAL

Subject Area: QC_TYPES
Entity Type: REF_MATL_ANALYTE

Description: FULL NAME: CONCENTRATION VALUE

A numeric value indicating the concentration of the ANALYTE in the REFERENCE MATERIAL.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: REG_METH_AGENCY

Subject Area: LABORATORY_TESTS
Entity Type: REGULATORY_METHOD

Description: FULL NAME: REGULATORY AGENCY

The agency which publishes the REGULATORY METHOD.

Properties: Mandatory Basic Text
Length: 5

Default: none

Attribute: REG_METH_ID

Subject Area: LABORATORY_TESTS
Entity Type: REGULATORY_METHOD

Description: FULL NAME: REGULATORY METHOD IDENTIFIER

The regulatory number which identifies the REGULATORY METHOD.

Properties: Mandatory Basic Text
Length: 25

Default: none

Attribute: REG_METH_DESC

Subject Area: LABORATORY_TESTS
Entity Type: REGULATORY_METHOD

Description: FULL NAME: REGULATORY METHOD DESCRIPTION

A textual description of the REGULATORY METHOD.

Properties: Mandatory Basic Text
Length: 80

Default: none

Attribute: REG_METH_NAM

Subject Area: LABORATORY_TESTS
Entity Type: REGULATORY_METHOD

Description: The full name for an ANALYTICAL METHOD.

Properties: Mandatory Basic Text
Length: 30

Default: none

Attribute: RIVER_NAM

Subject Area: MONITORING_LOCATIONS
Entity Type: RIVER

Description: Descriptive name for the body of water

Properties: Mandatory Basic Text
Length: 35

Default: none

Attribute: RIVER_ID

Subject Area: MONITORING_LOCATIONS
Entity Type: RIVER

Description: Identifier for a body of water such as a river, stream, or creek.
Example: CR for Clinch River

Properties: Mandatory Basic Text
Length: 2

Default: none

Attribute: SMPL_GEN_HIST_ID

Subject Area: SAMPLES
Entity Type: SAMPLE

Description: For historical data coming from the OREIS structures, this is the OREIS-generated identifier for the SAMPLE.

Properties: Optional Basic Text
Length: 15

Default: none

Attribute: SMPL_HIST_ID

Subject Area: SAMPLES
Entity Type: SAMPLE

Description: For historical data, this is the original sample identifier. These identifiers are not unique across SAMPLEs.

Properties: Optional Basic Text
Length: 15

Default: none

Attribute: SMPL_COMPOSITE_FLG

Subject Area: SAMPLES
Entity Type: SAMPLE

Description: This flag denotes whether the SAMPLE is a composite or not. Values are:
Y - Yes, the SAMPLE is a composite
N - No, the SAMPLE is not a composite.

All SAMPLEs must be associated with a MONITORING EVENT unless they are a composite.

Properties: Mandatory Basic Text
Length: 1

Default: none

Permitted Values	
Y	Yes, sample is a composite.
N	No, sample is not a composite.

Attribute: SMPL_BIOTA_STAT

Subject Area: SAMPLES
Entity Type: SAMPLE

Description: Status of the biota sample.

Valid values are: Dead, Near Dead, Anesthetized, Other (Frozen).

Properties: Optional Basic Text
Length: 10

Default: none

Attribute: SMPL_SPECIES

Subject Area: SAMPLES
Entity Type: SAMPLE

Description: Fundamental taxonomic classification category.

Properties: Optional Basic Text
Length: 30

Default: none

Attribute: SMPL_PROC_TYP_CODE

Subject Area: SAMPLES
Entity Type: SAMPLE

Description: Identifies activity used to process the sample. This includes both field and lab activities.

Properties: Optional Basic Text
Length: 15

Default: none

Attribute: SMPL_BANK_CODE

Subject Area: SAMPLES
Entity Type: SAMPLE

Description: A code used to show the river bank being sampled.
Valid values are:
L - left
R - right

Properties: Optional Basic Text
Length: 1

Default: none

Permitted Values	
L	Left Side of River.
R	Right Side of River.

Attribute: SMPL_SEDIMENT_TYP

Subject Area: SAMPLES
Entity Type: SAMPLE

Description: A visual classification of a sediment sample.

Properties: Optional Basic Text
Length: 10

Default: none

Attribute: SMPL_STAT_CODE

Subject Area: SAMPLES
Entity Type: SAMPLE

Description: A code which indicates the status of the SAMPLE.
Values include:
P - Planned
C - Created/Collected
R - Retired
U - Unable to collect
F - Field only
L - Lost
S - Surplus
H - Historical
SL - Sent to Lab

"P" is the default when the SAMPLE entity is created. The code is automatically changed to "C" when a SAMPLE is collected and/or placed into a container. "R", "L", "U", "F", "H", "SL", and "S" will have to be input manually.

Properties: Mandatory Basic Text
Length: 2

Default: none

Attribute: SMPL_INTV_UNIT

Subject Area: SAMPLES
Entity Type: SAMPLE

Description: The unit of measure used when reporting the Sample Start Interval and Sample End Interval for a SAMPLE.

Properties: Optional Basic Text
Length: 8

Default: none

Attribute: SMPL_CERT_LOT_NO

Subject Area: SAMPLES
Entity Type: SAMPLE

Description: This certificate shows the year the container was prepared, the manufacturer, the type of cleaning method used, and where the container was cleaned at.

Properties: Mandatory Basic Text
Length: 15

Default: none

Attribute: SMPL_COLL_EQUP_SER

Subject Area: SAMPLES
Entity Type: SAMPLE

Description: The serial number of the equipment used to collect the SAMPLE.

Properties: Optional Basic Text
Length: 8

Default: none

Attribute: SMPL_DTE

Subject Area: SAMPLES
Entity Type: SAMPLE

Description: The date that the SAMPLE was placed in its container.

NOTE: This attribute is mandatory whenever a SAMPLE is actually collected or created.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: SMPL_TIME

Subject Area: SAMPLES
Entity Type: SAMPLE

Description: The time that the SAMPLE was placed in its container..

NOTE: This attribute is mandatory whenever a SAMPLE is actually collected or created.

Properties: Optional Basic Number
Length: 4 Decimal places: 0

Default: none

Attribute: SMPL_FLD_LOG_BG_PG

Subject Area: SAMPLES
Entity Type: SAMPLE

Description: The page number in the field logbook where the information about the collection of the SAMPLE begins. NOTE: The Field Logbook is considered a type of SAMPLE DATA FORM and, therefore, the Field Logbook Id would be an occurrence in that entity.

NOTE: This attribute is mandatory if the SAMPLE TYPE is: - Field Sample CP - Areal Composite Sample VCP - Vertical Composite Sample (It is mandatory for the two types of composite SAMPLEs now because the rule has been made that all compositing will be done in the field and will therefore have a field logbook entry associated with it.)

Properties: Optional Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: SMPL_END_INTV

Subject Area: SAMPLES
Entity Type: SAMPLE

Description: Lower depth of a sample interval, measured below the ground surface.

Note: IEF Constraints
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating point values.

Properties: Optional Basic Number
Length: 8 Decimal places: 2

Default: none

Attribute: SMPL_BEG_INTV

Subject Area: SAMPLES
Entity Type: SAMPLE

Description: Upper depth of a sample interval, measured below the

ground surface.

Note: IEF Constraints
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating points.

Properties: Optional Basic Number
Length: 8 Decimal places: 2

Default: none

Attribute: SMPL_ID

Subject Area: SAMPLES
Entity Type: SAMPLE

Description: The unique identifier of a SAMPLE.

Properties: Mandatory Basic Text
Length: 15

Default: none

Attribute: SMPL_COMPL_CHK_FLG

Subject Area: SAMPLES
Entity Type: SAMPLE

Description: A flag that indicates whether the SAMPLE passed the completeness check. The default will be "N".

Properties: Mandatory Basic Text
Length: 1

Default Value: N

Permitted Values	
N	No, is default for this field.
Y	Yes.

Attribute: SMPL_COMMENT

Subject Area: SAMPLES
Entity Type: SAMPLE

Description: Comments or remarks about the SAMPLE.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: SMPLR_TYP_DESC

Subject Area: SAMPLES
Entity Type: SAMPLER_TYPE

Description: A text description for the Sampler Type Code.

Properties: Mandatory Basic Text
Length: 80

Default: none

Attribute: SMPLR_TYP_CODE

Subject Area: SAMPLES
Entity Type: SAMPLER_TYPE

Description: A code which denotes the type of equipment used to collect a SAMPLE during a SAMPLING OCCURRENCE.

Examples include: PONAR - a surface-sampling device VC - Vibra Core GC - Gravity Core Need to get additional values from CDM.

Properties: Mandatory Basic Text
Length: 3

Default: none

Attribute: SMPL_LAB_ID

Subject Area: SAMPLES
Entity Type: SAMPLE_LAB

Description: The identifier assigned to the SAMPLE by the LAB.

Properties: Optional Basic Text
Length: 15

Default: none

Attribute: SMPL_LAB_BATCH_ID

Subject Area: SAMPLES
Entity Type: SAMPLE_LAB

Description: This identifies the laboratory batch the SAMPLE was assigned to.

Properties: Optional Basic Text
Length: 10

Default: none

Attribute: SMPL_PAIR_TYP_NAM

Subject Area: SAMPLES
Entity Type: SAMPLE_PAIR_TYPE

Description: The name of the hydrograph sample pair type.

Examples include start pair, end pair, peak pair, rising limb pair (1-5), and falling limb pair (1-5).

Properties: Mandatory Basic Text
Length: 20

Default: none

Attribute: SMPL_PAIR_TYP_CODE

Subject Area: SAMPLES
Entity Type: SAMPLE_PAIR_TYPE

Description: A code used to denote the type of hydrograph sample pair.

Properties: Mandatory Basic Text
Length: 3

Default: none

Attribute: SMPL_REF_MATL_DTE

Subject Area: QC_TYPES
Entity Type: SAMPLE_REF_MATL

Description: This attribute was added for IEF construction.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: SR_SEQ_NO

Subject Area: SAMPLE_RESULTS
Entity Type: SAMPLE_RESULT

Description: A sequence number used to distinguish results for the same sample, same test, same result id, and same parameter.

Properties: Mandatory Basic Number
Length: 3 Decimal places. 0

Default: none

Attribute: SR_MISD_HLD_TIM_QL

Subject Area: SAMPLE_RESULTS
Entity Type: SAMPLE_RESULT

Description: FULL NAME: MISSED HOLDING TIME QUALIFIER

A code which indicates for the analysis for the analyte result met its holding time. This qualifier only applies to a result for a LAB TEST COMPONENT that has holding time associated with it.

Properties: Optional Basic Text
Length: 1

Default: none

Permitted Values	
L	Holding time was exceeded prior to receipt of sample in the laboratory.
X	Holding time exceeded.
P	Provisional answer due to prior set missing its holding time.

Attribute: SR_OUT_CST_LIM_FLG

Subject Area: SAMPLE_RESULTS
Entity Type: SAMPLE_RESULT

Description: FULL NAME: OUTSIDE CUSTOMER LIMIT FLAG

A flag indicating whether the result was within limits established by the customer.

Properties: Optional Basic Text
Length: 1

Default: none

Permitted Values	
Y	Yes, within Customer Limits.
N	No, not within Customer limits.

Attribute: SR_CNF_LVL_LIM_FLG

Subject Area: SAMPLE_RESULTS
Entity Type: SAMPLE_RESULT

Description: FULL NAME: CONFIDENCE LEVEL LIMIT FLAG

A flag indicating whether the result, if the limit of error were applied, would exceed the customer's specified action limit even though unadjusted by the confidence level it did not exceed the limit. This flag will indicate to the customer that the result was borderline. Valid values are: Y - With adjustment, the result exceeds the customer limit. N- With adjustment, the results does NOT exceed the customer limit.

Properties: Optional Basic Text
Length: 1

Default: none

Permitted Values	
Y	Yes, with adjustment, the result exceeds the Customer limit.
N	No, with adjustment, the result does not exceed Customer limit.

Attribute: SR_CONF_LVL

Subject Area: SAMPLE_RESULTS
Entity Type: SAMPLE_RESULT

Description: FULL NAME: CONFIDENCE LEVEL

A "plus or minus" value that describes the confidence level of the analysis (procedure run). For example, +/- .05. A default confidence level is calculated from the default percent precision for the LAB TEST COMPONENT but may be overridden. The PIP Team Report refers to this as the Result Uncertainty Value.

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating point values.

Properties: Optional Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: SR_PREFIX_QUAL

Subject Area: SAMPLE_RESULTS
Entity Type: SAMPLE_RESULT

Description: FULL NAME: RESULT PREFIX QUALIFIER

A qualifier indicating whether the result is below, within, or above range limits. Valid values are: <,>. Definition from PIP team report.

Properties: Optional Basic Text
Length: 1

Default: none

Permitted Values	
<	The actual value is below the given range limit.
>	The actual value is above the given range limit.

Attribute: SR_DATA_USE_QUAL

Subject Area: SAMPLE_RESULTS
Entity Type: SAMPLE_RESULT

Description: This qualifier is equivalent to the Data Quality Level. It denotes what the data can be used for.

An example might be: A or I - H.P Screening B or II - Characterization C or III - D or IV - Risk Assessment

Properties: Optional Basic Text
Length: 4

Default: none

Attribute: SR_COMMENT

Subject Area: SAMPLE_RESULTS
Entity Type: SAMPLE_RESULT

Description: Text which describes the SAMPLE RESULT.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: SR_TENTV_ID_COMPND

Subject Area: SAMPLE_RESULTS
Entity Type: SAMPLE_RESULT

Description: A flag that indicates whether the result was requested or is a Tentatively Identified Compound that was detected in a sample.

NOTE: This may be included as part of the Result Qualifier.

Properties: Optional Basic Text
Length: 1

Default: none

Attribute: SR_REV_COMMENT

Subject Area: SAMPLE_RESULTS
Entity Type: SAMPLE_RESULT

Description: Text describing the reason for a revision to a SAMPLE RESULT.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: SR_REV_FLG

Subject Area: SAMPLE_RESULTS
Entity Type: SAMPLE_RESULT

Description: A flag that indicates whether a SAMPLE RESULT has been revised. The default is "N" for NO.

Properties: Mandatory Basic Text
Length: 1

Default Value: N

Permitted Values	
N	No, Sample result not revised.
Y	Yes, Sample Result revised.

Attribute: SR_DILUTION_FAC

Subject Area: SAMPLE_RESULTS
Entity Type: SAMPLE_RESULT

Description: The ratio indicating the acutal dilution of the SAMPLE which produced the result.

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating points.

Properties: Optional Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: SR_CONV_UNIT

Subject Area: SAMPLE_RESULTS
Entity Type: SAMPLE_RESULT

Description: A coded value representing the preferred unit of measure for a parameter value.

Properties: Optional Basic Text
Length: 8

Default: none

Attribute: SR_CONV_VAL

Subject Area: SAMPLE_RESULTS
Entity Type: SAMPLE_RESULT

Description: A value representing the conversion of the Reported Result Value to a value expressed in the preferred

measurement unit.

Note: IEF Constraints

1. This attribute shall be implemented as an ORACLE 'Number' field to allow for floating points.

2. The length will be modified in ORACLE to reflect a length of 22 with 10 decimcal places.

Properties: Optional Basic Number
Length: 18 Decimal places: 0

Default: none

Attribute: SR_RPT_UNIT

Subject Area: SAMPLE_RESULTS
Entity Type: SAMPLE_RESULT

Description: A coded value identifying the units of measure used to report the parameter value.

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: SR_RPT_VAL

Subject Area: SAMPLE_RESULTS
Entity Type: SAMPLE_RESULT

Description: A number representing the numeric value of a PARAMETER reported as a result of analysis.

Properties: Mandatory Basic Number
Length: 18 Decimal places: 0

Default: none

Attribute: SR_ID

Subject Area: SAMPLE_RESULTS
Entity Type: SAMPLE_RESULT

Description: An identifier for an individual SAMPLE RESULT. This identifier is not unique across SAMPLEs. This field may be used to denote the type of results (i.e. concentration, Retention time, volume, etc.)

Properties: Mandatory Basic Text
Length: 15

Default: none

Attribute: SMPL_TST_COMMENT

Subject Area: SAMPLES

Entity Type: SAMPLE_TEST

Description: Comments or remarks about the SAMPLE TEST. May include information about color, clarity, texture, and artifacts.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: SMPL_TST_ASSOC_TYP

Subject Area: SAMPLES
Entity Type: SAMPLE_TEST

Description: The type of sample that was tested. This should be "SAMPLE" if the sample is a sample submitted by the customer. If the sample is an external quality control sample, the sample_assoc_type should be the lab code of the lab who is responsible for the sample.

Properties: Mandatory Basic Text
Length: 6

Default: none

Attribute: SMPL_TST_ASSOC_ID

Subject Area: SAMPLES
Entity Type: SAMPLE_TEST

Description: The identifier of the sample analyzed by the test: either a sample id or an external qc sample id (plus lab identifier).

Properties: Mandatory Basic Text
Length: 15

Default: none

Attribute: SMPL_TST_CST

Subject Area: SAMPLES
Entity Type: SAMPLE_TEST

Description: Cost charged by the laboratory to perform this test on this sample.

Properties: Optional Basic Number
Length: 7 Decimal places: 2

Default: none

Attribute: SMPL_TST_LAB_FILE

Subject Area: SAMPLES
Entity Type: SAMPLE_TEST

Description: Laboratory-generated name of the GC/MS data system file containing information pertaining to a particular analysis.

Properties: Optional Basic Text
Length: 14

Default: none

Attribute: SMPL_TST_GC_ID

Subject Area: SAMPLES
Entity Type: SAMPLE_TEST

Description: The internal diameter of the GC column in mm.

Properties: Optional Basic Number
Length: 4 Decimal places: 0

Default: none

Attribute: SMPL_TST_GC_COL

Subject Area: SAMPLES
Entity Type: SAMPLE_TEST

Description: Identifies stationary phase of the GC column.

Properties: Optional Basic Text
Length: 10

Default: none

Attribute: SMPL_TST_LVL

Subject Area: SAMPLES
Entity Type: SAMPLE_TEST

Description: Determination of concentration level made from the mandatory screening of soils.

Properties: Mandatory Basic Text
Length: 3

Default: none

Attribute: SMPL_TST_COMPL_TIM

Subject Area: SAMPLES
Entity Type: SAMPLE_TEST

Description: FULL NAME: COMPLETED TIME

The time that the SAMPLE TEST run was completed.

Properties: Optional Basic Number
Length: 4 Decimal places: 0

Default: none

Attribute: SMPL_TST_COMPL_DTE

Subject Area: SAMPLES
Entity Type: SAMPLE_TEST

Description: FULL NAME: COMPLETED DATE

The date that the SAMPLE TEST run was completed.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: SMPL_TST_BATCH_POS

Subject Area: SAMPLES
Entity Type: SAMPLE_TEST

Description: FULL NAME: BATCH POSITION NUMBER

A number indicating the SAMPLE TEST's position in a QC BATCH.

Properties: Optional Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: SMPL_TST_END_QTY

Subject Area: SAMPLES
Entity Type: SAMPLE_TEST

Description: FULL NAME: END QUANTITY VALUE

A numeric value indicating the quantity of the sample portion, used in the SAMPLE TEST run, remaining after completion of the run.

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating point values.

Properties: Optional Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: SMPL_TST_QTY_UNIT

Subject Area: SAMPLES
Entity Type: SAMPLE_TEST

Description: FULL NAME: QUANTITY UNIT

The unit of measure in which the SAMPLE TEST quantities are expressed.

Properties: Optional Basic Text
Length: 8

Default: none

Attribute: SMPL_TST_INIT_QTY

Subject Area: SAMPLES
Entity Type: SAMPLE_TEST

Description: FULL NAME: INITIAL QUANTITY VALUE

A numeric value indicating the quantity of the sample portion used in the SAMPLE TEST run prior to start of the run.

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating point values.

Properties: Optional Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: SMPL_TST_BATCH_NO

Subject Area: SAMPLES
Entity Type: SAMPLE_TEST

Description: The identifier of a group of chemically similar samples analyzed using a specific test with a common set of Quality Control samples.

Properties: Mandatory Basic Text
Length: 14

Default: none

Attribute: SMPL_TST_TIME

Subject Area: SAMPLES
Entity Type: SAMPLE_TEST

Description: The time that a SAMPLE TEST was performed. (started).

Properties: Mandatory Basic Number
Length: 4 Decimal places: 0

Default: none

Attribute: SMPL_TST_DTE

Subject Area: SAMPLES
Entity Type: SAMPLE_TEST

Description: The date that a SAMPLE TEST was performed (started).

Properties: Mandatory Basic Date
Length: 8

Default: none

Attribute: SMPL_TST_SEQ_NO

Subject Area: SAMPLES
Entity Type: SAMPLE_TEST

Description: This sequences the tests for a SAMPLE when the same test is performed using the same MEASUREMENT METHOD more than once.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: SMPL_TYP_NAM

Subject Area: SAMPLES
Entity Type: SAMPLE_TYPE

Description: Values include:
Split sample
Grab sample
Field sample
Duplicate sample
Control sample
Background sample
Sub-surface soil sample
Trip blank
Equipment rinse blank (field rinsate)
Laboratory rinsate

Properties: Mandatory Basic Text
Length: 50

Default: none

Attribute: SMPL_TYP_DESC

Subject Area: SAMPLES
Entity Type: SAMPLE_TYPE

Description: A description of the Sample Type Code.

Properties: Mandatory Basic Text
Length: 80

Default: none

Attribute: SMPL_TYP_CODE

Subject Area: SAMPLES
Entity Type: SAMPLE_TYPE

Description: A code identifying the categorization of a SAMPLE.

Examples include blank, duplicate, replicate, spike QA/QC sample, composite, or strictly a monitoring sample.

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: SMPL_WST_CODE_DTE

Subject Area: SAMPLES
Entity Type: SAMPLE_WASTE_CODE

Description: This attribute added for IEF construction.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: SMPL_PROCED_REV

Subject Area: SAMPLES
Entity Type: SAMPLING_PROCEDURE

Description: A number which denotes the revision of a SAMPLING PROCEDURE.

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: SMPL_PROCED_DESC

Subject Area: SAMPLES
Entity Type: SAMPLING_PROCEDURE

Description: The textual description of a SAMPLING PROCEDURE.

SOURCE: EMMIS
TYPE: BASIC

Properties: Mandatory Basic Text
Length: 80

Default: none

Attribute: SMPL_PROCED_NO

Subject Area: SAMPLES
Entity Type: SAMPLING_PROCEDURE

Description: A code which partially identifies a SAMPLING PROCEDURE.

SOURCE: OREIS

TYPE: DESIGNED

Properties: Mandatory Basic Text
Length: 15

Default: none

Attribute: SAP_ELE_ACT_DTE

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: SAP_ELEMENT

Description: The date that the SAP ELEMENT went into effect.

Properties: Mandatory Basic Date
Length: 8

Default: none

Attribute: SAP_ELE_INACT_DTE

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: SAP_ELEMENT

Description: The date that the SAP ELEMENT is no longer in effect.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: SAP_ELE_DTE

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: SAP_ELEMENT

Description: The effectivity date of the Sampling and Analysis Plan from which the SAP ELEMENT was derived.

Properties: Mandatory Basic Date
Length: 8

Default: none

Attribute: SAP_ELE_ID

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: SAP_ELEMENT

Description: The unique identifier of the Sampling and Analysis Plan from which the SAP ELEMENT was derived.

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: SDG_SHIP_ORD_FRM

Subject Area: SAMPLES
Entity Type: SDG_SHIP_CONTNR

Description: The shipping order form number (e.g. air bill number).

Properties: Optional Basic Text
Length: 10

Default: none

Attribute: SDG_TEMP_UNIT

Subject Area: SAMPLES
Entity Type: SDG_SHIP_CONTNR

Description: Unit for temperature.

Properties: Optional Basic Text
Length: 1

Default: none

Attribute: SDG_RCPT_COND

Subject Area: SAMPLES
Entity Type: SDG_SHIP_CONTNR

Description: Condition of the container upon arrival at destination.

Properties: Optional Basic Text
Length: 2

Default: none

Attribute: SDG_RCV_TEMP

Subject Area: SAMPLES
Entity Type: SDG_SHIP_CONTNR

Description: Temperature of shipping containter at time of receipt by the lab.

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating point values.

Properties: Optional Basic Number
Length: 3 Decimal places: 0

Default: none

Attribute: SDG_SHIP_TEMP

Subject Area: SAMPLES
Entity Type: SDG_SHIP_CONTNR

Description: Temperature of container at time of shipment.

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating points.

Properties: Optional Basic Number
Length: 4 Decimal places: 0

Default: none

Attribute: SDG_CONTNR_TYP

Subject Area: SAMPLES
Entity Type: SDG_SHIP_CONTNR

Description: The type of container used to ship the samples within a SAMPLE DELIVERY GROUP to the analytical laboratory.
Valid values include:
P - plastic cooler
C - cardboard box
O - other

Properties: Optional Basic Text
Length: 1

Default: none

Permitted Values	
C	Cardboard Box.
O	Other
P	Plastic Cooler

Attribute: SDG_CONTNR_NO

Subject Area: SAMPLES
Entity Type: SDG_SHIP_CONTNR

Description: The number on the shipping container that the SAMPLEs within a SAMPLE DELIVERY GROUP are shipped in.

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: SAP_MONIT_PLAN_ID

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: SMPL_ANLY_PLAN

Description: The unique identifier of the Monitoring Plan used to develop the SAMPLING AND ANALYSIS PLAN.

Properties: Mandatory Basic Text

Length: 10

Default: none

Attribute: SAP_ACT_DTE

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: SMPL_ANLY_PLAN

Description: The date the SAMPLING AND ANALYSIS PLAN went into effect.

Properties: Mandatory Basic Date
Length: 8

Default: none

Attribute: SAP_ID

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: SMPL_ANLY_PLAN

Description: A unique identifier for a Sampling and Analysis Plan. The plan, which is written for a specific PROGRAM, (e.g., Perimeter Surveillance, RCRA Sites, etc.) defines the sampling and analysis protocols for that program.

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: SMPL_ASSOC_FRM_DTE

Subject Area: SAMPLES
Entity Type: SMPL_ASSOC_FORM

Description: This attribute added for IEF construction.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: SMPL_ASSOC_QC_DTE

Subject Area: SAMPLES
Entity Type: SMPL_ASSOC_INT_QC

Description: This attribute added for IEF construction.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: SMPL_CONT_MIN_VOL

Subject Area: SAMPLES
Entity Type: SMPL_CONT_TYPE

Description: The numeric value indicating the minimum volume capacity of the specified container type.

SOURCE: EMMIS
TYPE: BASIC

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating point values.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 2

Default: none

Attribute: SMPL_CONT_UNT_ABBR

Subject Area: SAMPLES
Entity Type: SMPL_CONT_TYPE

Description: The standard abbreviation for the MEASUREMENT UNIT in which the Sampling Container Volume Value is expressed.

SOURCE: EMMIS
TYPE: BASIC

Properties: Mandatory Basic Text
Length: 8

Default: none

Attribute: SMPL_CONT_MATL_COD

Subject Area: SAMPLES
Entity Type: SMPL_CONT_TYPE

Description: A code indicating the type of material from which the container is made i.e., clear glass, amber glass, plastic, etc.

SOURCE: EMMIS
TYPE: DESIGNED

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: SDG_FIN_RPT_DTE

Subject Area: SAMPLES
Entity Type: SMPL_DELIVERY_GRP

Description: Date final report for sample delivery group was received

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: SDG_RPT_DUE_DTE

Subject Area: SAMPLES
Entity Type: SMPL_DELIVERY_GRP

Description: Date that report is due back from the lab.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: SDG_EPA_CASE_NO

Subject Area: SAMPLES
Entity Type: SMPL_DELIVERY_GRP

Description: A finite usually predetermined number of samples collected over a given time period from a particular site. Assigned by the Sample Management Office and consists of one or more sample delivery groups.

Properties: Optional Basic Number
Length: 5 Decimal places: 0

Default: none

Attribute: SDG_ANLY_REQD_DTE

Subject Area: SAMPLES
Entity Type: SMPL_DELIVERY_GRP

Description: The date when the analyses for the SAMPLEs in the SAMPLE DELIVERY GROUP are required to be completed by the LABORATORY. This is specified in the statement of work.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: SDG_LAB_SHP_DTE

Subject Area: SAMPLES
Entity Type: SMPL_DELIVERY_GRP

Description: The date that the SAMPLEs in the SAMPLE DELIVERY GROUP were shipped to a LABORATORY.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: SDG_LAB_RCD_DTE

Subject Area: SAMPLES
Entity Type: SMPL_DELIVERY_GRP

Description: The date that a LABORATORY received SAMPLEs within a SAMPLE DELIVERY GROUP for analysis. In most cases, this will be the same date that the SAMPLE was collected, but not always.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: SDG_SHP_CONT_NO

Subject Area: SAMPLES
Entity Type: SMPL_DELIVERY_GRP

Description: Number of shipping contract.

Properties: Optional Basic Text
Length: 10

Default: none

Attribute: SDG_NO

Subject Area: SAMPLES
Entity Type: SMPL_DELIVERY_GRP

Description: The unique identifier for a SAMPLE DELIVERY GROUP.

Properties: Mandatory Basic Text
Length: 9

Default: none

Attribute: SMPL_RQMT_ID

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: SMPL_REQUIREMENT

Description: The unique identifier for a SAMPLING REQUIREMENT.

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: SMPL_RSLT_QUAL_DTE

Subject Area: SAMPLE_RESULTS
Entity Type: SMPL_RSLT_QUAL

Description: This attribute added for IEF construction.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: SOW_METH_ID

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: SOW_METHOD

Description: The identifier for a method for analysis called out in a STATEMENT OF WORK.

Properties: Mandatory Basic Text
Length: 25

Default: none

Attribute: SOW_METH_PARAM_DTE

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: SOW_METH_PARAM

Description: This attribute was added for IEF construction.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: SOW_MAX_SMPL

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: STATEMENT_OF_WORK

Description: Maximum number of samples that can be analyzed under this statement of work.

Properties: Optional Basic Number
Length: 4 Decimal places: 0

Default: none

Attribute: SOW_FUND_AMT

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: STATEMENT_OF_WORK

Description: The funding amount (in dollars) allocated to the SOW for sample analysis as specified in the purchase request.

Properties: Optional Basic Number
Length: 9 Decimal places: 2

Default: none

Attribute: SOW_PURCH_REQ_NO

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: STATEMENT_OF_WORK

Description: The number assigned by MMES to the purchase request specifying the total funding assigned for sample analysis to the SOW.

Properties: Optional Basic Text
Length: 6

Default: none

Attribute: SOW_CHARGE_NO

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: STATEMENT_OF_WORK

Description: The account number to which encumbered expenses for sample analysis for the SOW are to be charged.

Properties: Optional Basic Text
Length: 9

Default: none

Attribute: SOW_APO_NO

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: STATEMENT_OF_WORK

Description: The number assigned by the Analytical Projects Office (APO) to a SOW when the project requires sample analysis subcontracted to an offsite LABORATORY.

Properties: Optional Basic Text
Length: 18

Default: none

Attribute: SOW_NO

Subject Area: ENVIRONMENTAL_PROJECTS
Entity Type: STATEMENT_OF_WORK

Description: The number assigned to the Statement of Work (SOW) the describes the ENV PROJECT TASK.

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating point values.

Properties: Mandatory Basic Text
Length: 18

Default: none

Attribute: TEAM_MEM_ROLE_DTE

Subject Area: MONITORING_TEAMS
Entity Type: TEAM_MEMBER_ROLE

Description: This attribute was added for IEF construction.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: TEAM_ROLE_NAM

Subject Area: MONITORING_TEAMS
Entity Type: TEAM_ROLE

Description: The descriptive name of the role.

Properties: Mandatory Basic Text
Length: 50

Default: none

Attribute: TEAM_ROLE_CODE

Subject Area: MONITORING_TEAMS
Entity Type: TEAM_ROLE

Description: A code used to uniquely identify a role for a MONITORING TEAM.

Properties: Mandatory Basic Text
Length: 3

Default: none

Attribute: TPQC_CRI_UNIT

Subject Area: LABORATORY_TESTS
Entity Type: TEST_PARAM_QC_LIM

Description: FULL NAME: CRITERION UNIT

The units in which the LAB TEST COMP ACCEPT CRI Upper and Lower Limit Values are expressed.

Properties: Mandatory Basic Text
Length: 8

Default: none

Attribute: TPQC_LOW_LIM_VAL

Subject Area: LABORATORY_TESTS
Entity Type: TEST_PARAM_QC_LIM

Description: FULL NAME: LOWER LIMIT VALUE

The lowest level at which the QC RESULT for

the specified LAB TEST COMPONENT and QC COMPONENT is acceptable. If the value is below this limit the associated SAMPLE RESULTs are questionable.

Properties: Optional Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: TPQC_UP_LIM_VAL

Subject Area: LABORATORY_TESTS
Entity Type: TEST_PARAM_QC_LIM

Description: FULL NAME: UPPER LIMIT VALUE

The highest level at which a QC RESULT associated with the specified LAB TEST COMPONENT and QC TYPE COMPONENT is acceptable. If the result is above the limit, the associated SAMPLE RESULTs are questionable.

Properties: Optional Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: WEIR_STD_FLOW_VAL

Subject Area: MONITORING_LOCATIONS
Entity Type: USGS_WEIR_FLOW

Description: FULL NAME: Weir Standard Flow Value

The value that is reported as being the standard flow value for the weir when the water level is at the specified height.

SOURCE: EMMIS Project
TYPE: BASIC

Note: IEF Constraint
This attribute shall be implemented as an ORACLE 'Number' field to allow for floating point values.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 0

Default: none

Attribute: WEIR_FLOW_HGT_VAL

Subject Area: MONITORING_LOCATIONS
Entity Type: USGS_WEIR_FLOW

Description: FULL NAME: Weir Height Value

The value of the water height at which the flow for a weir is defined.

SOURCE: EMMIS Project

TYPE: BASIC

Properties: Mandatory Basic Number
Length: 8 Decimal places: 2

Default: none

Attribute: WEIR_FLOW_REC_DTE

Subject Area: MONITORING_LOCATIONS
Entity Type: USGS_WEIR_FLOW

Description: FULL NAME: Weir Flow Record Date The date that data associated with an instance of WEIR FLOW was last entered or updated.

SOURCE: EMMIS
TYPE: BASIC

Properties: Mandatory Basic Date
Length: 8

Default: none

Attribute: WEIR_FLOW_REC_TIME

Subject Area: MONITORING_LOCATIONS
Entity Type: USGS_WEIR_FLOW

Description: FULL NAME: Weir Flow Record Time The time that data associated with an instance of WEIR FLOW was last entered or updated.

SOURCE: EMMIS
TYPE: BASIC

Properties: Mandatory Basic Number
Length: 4 Decimal places: 0

Default: none

Attribute: WEIR_FLOW_VERF_FLG

Subject Area: MONITORING_LOCATIONS
Entity Type: USGS_WEIR_FLOW

Description: FULL NAME: Weir Flow Verified Flag

A flag indicating that the data input to WEIR FLOW has been verified as correct and can be used by the EMMIS system.

SOURCE: EMMIS
TYPE: BASIC

Properties: Mandatory Basic Text
Length: 4

Default: none

Attribute: WEIR_FLOW_BADGE_NO

Subject Area: MONITORING_LOCATIONS
Entity Type: USGS_WEIR_FLOW

Description: FULL NAME: Employee Recorded Weir Flow Badge Number

The badge number of the employee who last entered or updated data associated with an instance of WEIR FLOW.

SOURCE: EMMIS
TYPE: BASIC

Properties: Mandatory Basic Text
Length: 6

Default: none

Attribute: VLD_RSLT_QUAL_TYP

Subject Area: SAMPLE_RESULTS
Entity Type: VALID_RSLT_QUAL

Description: Type of result qualifier.

Properties: Mandatory Basic Text
Length: 1

Default: none

Attribute: VLD_RSLT_QUAL

Subject Area: SAMPLE_RESULTS
Entity Type: VALID_RSLT_QUAL

Description: FULL NAME: RESULT QUALIFIER

A code indicating the EPA or Laboratory qualifier.

Properties: Mandatory Basic Text
Length: 4

Default: none

Attribute: VLS_RSLT_QUAL_DESC

Subject Area: SAMPLE_RESULTS
Entity Type: VALID_RSLT_QUAL

Description: FULL NAME: RESULT QUALIFIER DESCRIPTION

The textual description associated with a RESULT QUALIFIER.

Properties: Mandatory Basic Text
Length: 80

Default: none

Attribute: WASTE_CODE_ID

Subject Area: WASTES
Entity Type: WASTE_CODE

Description: FULL NAME: WASTE CODE ID
A code which is used throughout industry to identify hazardous characteristics of waste.

Properties: Mandatory Basic Text
Length: 4

Default: none

Attribute: WASTE_CODE_DESC

Subject Area: WASTES
Entity Type: WASTE_CODE

Description: FULL NAME: WASTE CODE DESCRIPTION

The textual description for the WASTE CODE.

Properties: Mandatory Basic Text
Length: 80

Default: none

Attribute: WELL_USE

Subject Area: WELLS
Entity Type: WELL

Description: The current use of the WELL.

Values are:
I - Industrial
M - Monitoring
O - Other
P - Public water supply

Properties: Mandatory Basic Text
Length: 1

Default: none

Attribute: WELL_TRNSMSVTY

Subject Area: WELLS
Entity Type: WELL

Description: The rate of flow of water through a vertical strip of acquifer one foot wide under prevailing water temperature and a hydralic gradient of 1:1. This is measured in cubic feet per day per foot of acquifer.

Properties: Optional Basic Number
Length: 8 Decimal places: 4

Default: none

Attribute: WELL_PERMIT_NO

Subject Area: WELLS
Entity Type: WELL

Description: The value of the permit number assigned for the WELL.

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: WELL_ROCK_DPTH

Subject Area: WELLS
Entity Type: WELL

Description: Depth in feet to the top of the rock, relative to the ground surface.

Properties: Optional Basic Number
Length: 8 Decimal places: 2

Default: none

Attribute: WELL_INIT_WTR_DPTH

Subject Area: WELLS
Entity Type: WELL

Description: Depth in feet from the ground surface to the ground water level at the time the BORE HOLE was drilled.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 2

Default: none

Attribute: WELL_TYP

Subject Area: WELLS
Entity Type: WELL

Description: Identifies the well as a monitoring well or piezometer.

Properties: Mandatory Basic Text
Length: 3

Default: none

Attribute: WELL_COMMENT

Subject Area: WELLS
Entity Type: WELL

Description: Comments or remarks about the well.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: WELL_GROUT

Subject Area: WELLS
Entity Type: WELL

Description: Coded value identifying the grout used in construction of the well.

Properties: Optional Basic Text
Length: 4

Default: none

Attribute: WELL_CONSTR_DPTH

Subject Area: WELLS
Entity Type: WELL

Description: The total depth in feet of the well below the ground surface at the time of its initial installation.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 2

Default: none

Attribute: WELL_GEO_UNIT

Subject Area: WELLS
Entity Type: WELL

Description: The general hydrologic description of a well completion zone.

Values are:
? - unknown
A - Aquifer
C - Lower or confined aquifer
L - Confining layer or Aquiclude
S - Surface Aquifer
U - Unsaturated Zone
W - Water Table Aquifer or Surface Aquifer

Properties: Optional Basic Text
Length: 8

Default: none

Attribute: WELL_UPRGT_MNT_FLG

Subject Area: WELLS
Entity Type: WELL

Description: A flag use to indicate whether the well is an upright or flush mount. The default is Y indicating the well is upright.

Properties: Mandatory Basic Text
Length: 1

Default Value: Y

Permitted Values	
Y	Yes, well is in an upright position.
N	No, well is not in an upright position.

Attribute: WELL_AQUIFIER

Subject Area: WELLS
Entity Type: WELL

Description: Value identifying the aquifier in which the well was completed. If not completed in an aquifier, leave this field blank.

Expected values are: Rome, Conasauga, Knox, Chickamauga).

Properties: Optional Basic Text
Length: 6

Default: none

Attribute: WELL_COMP_EVT_ID

Subject Area: WELLS
Entity Type: WELL_COMPONENT

Description: The unique identifier of the event that resulted in the WELL COMPONENT being installed in the WELL.

Note: An either/or situation exists between WELL COMPONENT and WELL INSTALLATION EVENT or WELL MODIFICATION EVENT. Either the WELL INSTALLATION EVENT or the WELL MODIFICATION EVENT (but not both) can result in a WELL COMPONENT being installed in a WELL. For that reason, neither relationship is part of the identifier for WELL COMPONENT. The Well Event Identifier will contain the key of the event which resulted in the component being installed in the WELL.

Properties: Mandatory Basic Text
Length: 32

Default: none

Attribute: WELL_COMP_TOP_DPTH

Subject Area: WELLS
Entity Type: WELL_COMPONENT

Description: The depth in feet (from the ground surface) to the top of a WELL COMPONENT.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 2

Default: none

Attribute: WELL_COMP_BOT_DPTH

Subject Area: WELLS
Entity Type: WELL_COMPONENT

Description: The depth in feet (from the ground surface) to the bottom of a WELL COMPONENT.

Properties: Mandatory Basic Number
Length: 8 Decimal places: 2

Default: none

Attribute: WELL_COMP_INS_DIAM

Subject Area: WELLS
Entity Type: WELL_COMPONENT

Description: The diameter, measured from inside wall to inside wall, of a WELL COMPONENT. This is reported in inches.

Properties: Optional Basic Number
Length: 8 Decimal places: 3

Default: none

Attribute: WELL_COMP_OUT_DIAM

Subject Area: WELLS
Entity Type: WELL_COMPONENT

Description: The diameter, measured from outside wall to outside wall, of a WELL COMPONENT. This is measured in inches.

Properties: Optional Basic Number
Length: 8 Decimal places: 3

Default: none

Attribute: WELL_COMP_SLOT_SIZ

Subject Area: WELLS
Entity Type: WELL_COMPONENT

Description: The vertical size in inches of the slot opening in a screen (a particular type of WELL COMPONENT).

Properties: Optional Basic Number

Length: 6 Decimal places: 2

Default: none

Attribute: WELL_COMP_MFG_NAM

Subject Area: WELLS
Entity Type: WELL_COMPONENT

Description: The name of the company that manufactured the WELL COMPONENT.

Properties: Mandatory Basic Text
Length: 30

Default: none

Attribute: WELL_COMP_REM_DTE

Subject Area: WELLS
Entity Type: WELL_COMPONENT

Description: The date on which a particular WELL COMPONENT was removed from the WELL.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: WELL_DEV_COMMENT

Subject Area: WELLS
Entity Type: WELL_DEV_EVENT

Description: Comments or remarks about the well development event.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: WELL_DEV_METH

Subject Area: WELLS
Entity Type: WELL_DEV_EVENT

Description: Method by which the well was developed. Possible values are: Swab, Surge, or Pump.

Properties: Mandatory Basic Text
Length: 10

Default: none

Attribute: WELL_DEV_END_DTE

Subject Area: WELLS

Entity Type: WELL_DEV_EVENT

Description: The date the WELL DEVELOPMENT EVENT was completed.

Properties: Optional Basic Date
Length: 8

Default: none

Attribute: WI_MEAS_ELEV

Subject Area: WELLS
Entity Type: WELL_INSTALL_EVENT

Description: Elevation of the measurement reference point used for groundwater depth level measurements expressed in FEET above mean sea level; normally, the elevation at the top of the well casing.

Properties: Optional Basic Number
Length: 8 Decimal places: 2

Default: none

Attribute: WI_EQUP_LOG_FLG

Subject Area: WELLS
Entity Type: WELL_INSTALL_EVENT

Description: A flag indicating whether or not the equipment used during a construction event was recorded on an equipment log.

Properties: Mandatory Basic Text
Length: 1

Default: none

Permitted Values	
Y	Yes, used in construction event and recorded in equipment log.
N	No, used in a construction event but not recorded as part of an equipment log.

Attribute: WI_COMMENT

Subject Area: WELLS
Entity Type: WELL_INSTALL_EVENT

Description: Comments or remarks about the construction of the well.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: WI_DEV_LOG_FLG

Subject Area: WELLS
Entity Type: WELL_INSTALL_EVENT

Description: A flag (Y/N) indicating that a well development log was filled out after the well is installed. The log is used to record the volume of water pumped from the well during the development event, field measurements taken, and where the water was discharged to.

Properties: Mandatory Basic Text
Length: 1

Default: none

Permitted Values	
Y	Yes, a well development log was filled out after a well was installed.
N	No, a well development log was not filled out after a well installation.

Attribute: WI_COMPL_DTE

Subject Area: WELLS
Entity Type: WELL_INSTALL_EVENT

Description: Date that the construction of the well was completed.

Properties: Mandatory Basic Date
Length: 8

Default: none

Attribute: WI_CONST_CONTCTR

Subject Area: WELLS
Entity Type: WELL_INSTALL_EVENT

Description: Contractor responsible for the construction of the well.

Properties: Optional Basic Text
Length: 25

Default: none

Attribute: WELL_MOD_ACT

Subject Area: WELLS
Entity Type: WELL_MOD_EVENT

Description: A textual description of the modification activity

being performed at the well.

Properties: Optional Basic Text
Length: 80

Default: none

Attribute: WELL_MOD_COMPL_DTE

Subject Area: WELLS
Entity Type: WELL_MOD_EVENT

Description: The date the modifications to the well were finished.

Properties: Mandatory Basic Date
Length: 8

Default: none

Attribute: WELL_MOD_TYP

Subject Area: WELLS
Entity Type: WELL_MOD_EVENT

Description: The type of modification being made to the WELL.

Properties: Mandatory Basic Text
Length: 25

Default: none

Attribute: WELL_MOD_COMMENT

Subject Area: WELLS
Entity Type: WELL_MOD_EVENT

Description: Any additional comments or information about the well modification event.

Properties: Optional Basic Text
Length: 200

Default: none

Attribute: WELL_MOD_MEAS_ELEV

Subject Area: WELLS
Entity Type: WELL_MOD_EVENT

Description: Elevation of the measurement reference point used for groundwater depth level measurements expressed in FEET above mean sea level; normally, the elevation at the top of the well casing.

Properties: Optional Basic Number
Length: 8 Decimal places: 2

Default: none

Attribute: ACTION_ENTRY

Subject Area: WAG6
Entity Type: IEF_SUPPLIED

Description:

Properties: Mandatory Basic Text
Length: 2

Default: none

Attribute: COMMAND

Subject Area: WAG6
Entity Type: IEF_SUPPLIED

Description:

Properties: Mandatory Basic Text
Length: 80

Default: none

Attribute: COUNT

Subject Area: WAG6
Entity Type: IEF_SUPPLIED

Description:

Properties: Mandatory Basic Number
Length: 9 Decimal places: 0

Default: none

Attribute: TOTAL_REAL

Subject Area: WAG6
Entity Type: IEF_SUPPLIED

Description:

Properties: Mandatory Basic Number
Length: 15 Decimal places: 4

Default: none

Attribute: TOTAL_CURRENCY

Subject Area: WAG6
Entity Type: IEF_SUPPLIED

Description:

Properties: Mandatory Basic Number
Length: 15 Decimal places: 2

Default: none

Attribute: TOTAL_INTEGER

Subject Area: WAG6
Entity Type: IEF_SUPPLIED

Description:

Properties: Mandatory Basic Number
Length: 15 Decimal places: 0

Default: none

Attribute: PERCENTAGE

Subject Area: WAG6
Entity Type: IEF_SUPPLIED

Description:

Properties: Mandatory Basic Number
Length: 3 Decimal places: 0

Default: none

Attribute: AVERAGE_REAL

Subject Area: WAG6
Entity Type: IEF_SUPPLIED

Description:

Properties: Mandatory Basic Number
Length: 15 Decimal places: 4

Default: none

Attribute: AVERAGE_CURRENCY

Subject Area: WAG6
Entity Type: IEF_SUPPLIED

Description:

Properties: Mandatory Basic Number
Length: 11 Decimal places: 2

Default: none

Attribute: AVERAGE_INTEGER

Subject Area: WAG6
Entity Type: IEF_SUPPLIED

Description:

Properties: Mandatory Basic Number

Length: 9 Decimal places: 0

Default: none

Attribute: FLAG

Subject Area: WAG6
Entity Type: IEF_SUPPLIED

Description:

Properties: Mandatory Basic Text
Length: 1

Default: none

Permitted Values
Y
N

Attribute: SUBSCRIPT

Subject Area: WAG6
Entity Type: IEF_SUPPLIED

Description:

Properties: Mandatory Basic Number
Length: 9 Decimal places: 0

Default: none

-End of Report-

Appendix E

OREIS VERSION 2.0 MAPPING TO IMS

OREIS - WAG6/CRRI MAPPING
OREIS DATA MODEL

OREIS		WAG6		
Table	**Attribute**	**Table**	**Attribute**	**Comment**
BORECONS	D_ADDED■	OREIS ASSIGNED		
	TRANS_ID■	OREIS ASSIGNED		
	WELL_ID■	MONIT_LOCATION	ML_ID■	OREIS Num(8,0)—WAG6 Char(9)
	BORE_DEPTH	BORE_HOLE	BH_DPTH■	
	BORE_METHOD			
	COMMENTS	BORE_HOLE	BH_COMMENT	
	CONTRACTOR	DRILLING_EVENT	DE_CONTCTR■	
	DRILL_EQUIP	DRILLING_EVENT	DE_EQUP_TYPE■	
	D_COMPLETED	DRILLING_EVENT	DE_CMPLT_DTE	
	D_MODIFIED	OREIS ASSIGNED		
	D_PLUGGED	PLUGGING_EVENT	PLUG_EVT_DTE■	
	D_STARTED	DRILLING_EVENT	DE_BEG_DTE■	
	FORMATION_NAME			
	GROUP_NAME			
	HOLE_DIAM	BORE_HOLE	BH_DIAM■	
	PERMIT_NUMBER	BORE_HOLE	BH_PERMIT_NO	
	P_A_METHOD			
	WATER_DEPTH	BORE_HOLE	BH_INIT_WTR_DPTH	
CODE	CODE■	COMP_MATERIAL	COMP_MATL_CODE■	For CODETYPE = WC_MAT
		DATA_USE_QUALIFIER	DATA_USE_QUAL_CODE■	For CODETYPE = DATAQUAL
		DRILLING_METHOD	DRILL_METH_CODE	For CODETYPE = CONS_METHOD
		GEOLOGIC_FORMATION	GEO_FORM_CODE	For CODETYPE = FORMATION_NAME
		GEOLOGIC_GROUP	GEO_GRP_CODE■	For CODETYPE = GROUP_NAME
		HOLE_INTERVAL_TYPE	INTV_CHAR_TYP_CODE■	For CODETYPE = LITHTYPE
		LAB	LAB_CODE■	For CODETYPE = LAB_CODE
		MATRIX_TYPE	MATRX_TYPE_CODE	For CODETYPE = MED_TYPE
		MEASUREMENT_UNIT	MEAS_UNIT_ABBR■	For CODETYPE = UNITS
		PARAM_ANLY_GRP	PARAM_ANLY_GRP_COD■	For CODETYPE = ANA_TYPE
		PLUG_MATERIAL	PLUG_MATL_CODE■	For CODETYPE = PLUG_MAT
		PURGE_METHOD	PURG_METH_CODE■	For CODETYPE = PURGE_METH

■ MANDATORY FIELD - Required by parent database.

OREIS - WAG6/CRRI MAPPING
OREIS DATA MODEL

OREIS		WAG6		
Table	**Attribute**	**Table**	**Attribute**	**Comment**
		SAMPLE_TYPE	SAMPLE_TYPE_CODE■	For CODETYPE = SMP_TYPE
		SAMPLER_TYPE	SAMPLER_TYPE_CODE■	For CODETYPE = SMP_METHOD
		VALID_RSLT_QUAL	VLD_RSLT_QUAL_TYPE■	For CODETYPE = RSLTQUAL
	CODE_TYPE■			
	D_ADDED■			
	TRANS_ID■	OREIS ASSIGNED		
	CODE_DESCRIPTION	COMP_MATERIAL	COMP_MATL_NAM	For CODETYPE = WC_MAT
		DATA_USE_QUALIFIER	DATA_USE_QUAL_DESC	For CODETYPE = DATAQUAL
		DRILLING_METHOD	DRILL_METH_DESC	For CODETYPE = CONS_METHOD
		GEOLOGIC_FORMATION	GEO_FORM_NAM■	For CODETYPE = FORMATION_NAME
		GEOLOGIC_GROUP	GEO_GRP_NAM	For CODETYPE = GROUP_NAME
		HOLE_INTERVAL_TYPE	INTV_CHAR_TYP_DESC■	For CODETYPE = LITHTYPE
		LAB	LAB_NAM■	For CODETYPE = LAB_CODE
		MATRIX_TYPE	MATRX_TYP_DESC	For CODETYPE = MED_TYPE
		MEASUREMENT_UNIT	MEAS_UNIT_NAM■	For CODETYPE = UNITS
		PARAM_ANLY_GRP	PARAM_ANLY_GRP_NAM■	For CODETYPE = ANA_TYPE
		PLUG_MATERIAL	PLUG_MATL_NAM■	For CODETYPE = PLUG_MAT
		PURGE_METHOD	PURG_METH_DESC■	For CODETYPE = PURGE_METH
		SAMPLE_TYPE	SMPL_TYP_DESC■	For CODETYPE = SMP_TYPE
		SAMPLER_TYPE	SMPLR_TYP_DESC■	For CODETYPE = SMP_METHOD
		VALID_RSLT_QUAL	VLD_RSLT_QUAL_DESC■	For CODETYPE = RSLTQUAL
CRITERIA	D_ADDED■	OREIS ASSIGNED		
	MED_TYPE■			
	PARAMTR■	LAB_TEST_PARAMETER	PARAM_CODE■	
	STD_NAME■	REGULATORY_METHOD	REG_METH_NAM■	OREIS Char(20)—WAG6 Char(30)
	TRANS_ID■	OREIS ASSIGNED		
	COMMENTS			
	D_MODIFIED			
	STATUS_CRIT			

■ MANDATORY FIELD - Required by parent database.

OREIS - WAG6/CRRI MAPPING
OREIS DATA MODEL

OREIS		WAG6		
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	STD_LIMIT	LAB_TEST_PARAM_LIM	LAB_TST_LOW_LIM	OREIS NUM(10,5)—WAG6 Num(8)
	TAB_TYPE			
	UNITS			
FLD_EVENT	D_ADDED■	OREIS ASSIGNED		
	FLD_EVENT_ID■	OREIS ASSIGNED		
	STATION_ID■	OREIS ASSIGNED		
	TRANS_ID■	OREIS ASSIGNED		
	COMMENTS	MONITORING_EVENT	ME_COMMENT	
	D_COLLECTED	FIELD_MEASUREMENT	FM_DTE_COLL■	
		MONITORING_EVENT	ME_BEG_DTE■	OREIS Char(10)—WAG6 Char(5)
	D_MODIFIED	OREIS ASSIGNED		
	MED_TYPE			
	SMP_GROUP			
	SMP_LEVEL	FIELD_MEASUREMENT	FM_DEPTH	
	SMP_METHOD			
	SMP_TYPE			
FLD_MEAS	D_ADDED■	OREIS ASSIGNED		
	FLD_EVENT_ID■	OREIS ASSIGNED		
	FLD_MEAS_ID■	OREIS ASSIGNED		
	PARAMTR■	FIELD_MEASUREMENT	PARAM_CODE■	
	TRANS_ID■	OREIS ASSIGNED		
	COMMENTS	FIELD_MEASUREMENT	FM_COMMENT	
	DATAQUAL	FIELD_MEASUREMENT	FM_DATA_USE_QUAL	
	D_MODIFIED	OREIS ASSIGNED		
	RESULTS	FIELD_MEASUREMENT	FM_RPT_RSLT■	OREIS Num(38,10)—WAG6 CHAR(8)
	RSLTQUAL	FIELD_MEASUREMENT	FM_RSLT_QUAL	
	SUM_METHOD	FIELD_MEASUREMENT	FM_METH■	OREIS Char(6)—WAG6 Char(10)
	T_COLLECTED	FIELD_MEASUREMENT	FM_TIME_COLL■	

■ MANDATORY FIELD - Required by parent database.

OREIS - WAG6/CRRI MAPPING
OREIS DATA MODEL

OREIS		WAG6		
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	UNITS	FIELD_MEASUREMENT	FM_RPT_UNIT■	OREIS Char(10)—WAG6 Char(18)
	VALIDATION			
FLD_SMP	D_ADDED■	OREIS ASSIGNED		
	FLD_SMP_ID■	SAMPLE	SMPL_GEM_HIST_ID	
	STATION_ID■	OREIS ASSIGNED		
	TRANS_ID■	OREIS ASSIGNED		
	COMMENTS	SAMPLE	SMPL_COMMENT	
	DEPTH_WATER			
	D_COLLECTED	SAMPLE	SMPL_DTE	
	D_MODIFIED	OREIS ASSIGNED		
	FLD_EVENT_ID			
	INTERVAL			NEEDED ??
	MED_TYPE	SAMPLE	MATRX_TYP_CODE	OREIS Char(2)—WAG6 char(5) This WAG6 field will contain a 2 char code depending upon the value set in MATRIX_TYPE .MATRX_FLD_LAB_CODE in WAG6.
	PURGED_VOL	PURGE_EVENT	PURG_EVT_PURG_VOL■	OREIS Num(8,2)—WAG6 Num(8)
	SAMPLE_ID	SAMPLE	SMPL_HIST_ID	
	SMP_END_DEPTH	SAMPLE	SMPL_END_INTV	
	SMP_GROUP			
	SMP_LEVEL			
	SMP_METHOD	SAMPLE	SMPLR_TYP_CODE■	OREIS Char(10)—WAG6 Char(3)
	SMP_STRT_DEPTH	SAMPLE	SMPL_BEG_INTV	
	SMP_TYPE	SAMPLE	SMPL_TYP_CODE■	
	T_COLLECTED	SAMPLE	SMPL_TIME	
	WAG6_SMPL_ID	SAMPLE	SMPL_ID	
LAB_MEAS	D_ADDED■	OREIS ASSIGNED		
	LAB_MEAS_ID■	OREIS ASSIGNED		
	LAB_SMP_ID■	OREIS ASSIGNED		
	PARAMTR■	SAMPLE_RESULT	PARAM_CODE■	

■ MANDATORY FIELD - Required by parent database.

OREIS - WAG6/CRRI MAPPING
OREIS DATA MODEL

OREIS		WAG6		
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	TRANS_ID■	OREIS ASSIGNED		
	ANA_METHOD	SAMPLE_TEST	REG_METH_ID■	OREIS Char(18)—WAG6 Char(25)
	ANA_TYPE■			
	COMMENTS	SAMPLE_RESULT	SR_COMMENT	
	DATAQUAL	SAMPLE_RESULT	SR_DATA_USE_QUAL	
	DETECT_LIMIT	LAB_TEST_PARAM_LIM	DET_LIM_VAL	OREIS NUM(38,10)—WAG6 Num(8)
	DILU_FAC	SAMPLE_RESULT	SR_DILUTION_FAC■	OREIS Num(8,2)—WAG6 Num(8)
	D_MODIFIED	OREIS ASSIGNED		
	LAB_METHOD	SAMPLE_TEST	LAB_TST_ID	
		LAB_TEST	LAB_TST_ID	
	RAD_ERR			
	RESULTS	SAMPLE_RESULT	SR_RPT_VAL■	OREIS Num(38,10)—WAG6 Num(18,0)
	RSLTQUAL			
	UNITS	SAMPLE_RESULT	SR_RPT_UNIT■	
	VALIDATION			
LAB_SMP	D_ADDED■	OREIS ASSIGNED		
	FLD_SMP_ID■	OREIS ASSIGNED		
	LAB_SMP_ID■	SAMPLE	SMPL_GEN_HIST_ID	
	SMP_CATEGORY■			??
	TRANS_ID■	OREIS ASSIGNED		
	COMMENTS	SAMPLE	SMPL_COMMENT	
	D_MODIFIED	OREIS ASSIGNED		
	LAB_CODE	SAMPLE_LAB	LAB_CODE■	
	LAB_SAMPLE_ID	SAMPLE_LAB	LAB_SMPL_ID	
	MATRIX	SAMPLE	MATRX_TYP_CODE	OREIS Char(5)—WAG6 char(5)This WAG6 field will contain a 2 char code depending upon the value set in MATRIX_TYPE .MATRX_FLD_LAB_CODE in WAG6
	SDG_NUM	SMPL_DELIVERY_GRP	SDG_NO	
	SMP_PREP	SAMPLE	SMPL_PROC_TYP_CODE	OREIS CHAR(2)—WAG6 Char(15)
	WAG6_SMPL_ID	SAMPLE	SMPL_ID	

■ MANDATORY FIELD - Required by parent database.

OREIS - WAG6/CRRI MAPPING
OREIS DATA MODEL

OREIS		WAG6		
Table	**Attribute**	**Table**	**Attribute**	**Comment**
LITHOLOGY	D_ADDED■	OREIS ASSIGNED		
	LITHOLOGY_ID■	OREIS ASSIGNED		
	STRAT_SEQ■			
	TRANS_ID■	OREIS ASSIGNED		
	WELL_ID■	WELL	ML_ID■	
	ASTMCODE	HOLE_INTERVAL	HI_ASTM_CODE	
	COMMENTS	HOLE_INTERVAL	HI_COMMENT	
	D_MODIFIED	OREIS ASSIGNED		
	FORMATION_NAME	GEOLOGIC_FORMATION	GEO_FORM_NAM■	OREIS Char(30)—WAG6 Char(4) table lookup using GEO_FORM_CODE which must be found in WELL or BORE_HOLE
	GROUP_NAME	GEOLOGIC_GROUP	GEO_GRP_NAM	table lookup where GEO_GRP_CODE is found in GEO_FORM_NAM
	LITHTYPE	HOLE_INTERVAL_CHAR	INTV_CHAR_TYP_CODE■	OREIS Char(4)—WAG6 Char(10)
	RECOV_PLAN	HOLE_INTERVAL	HI_PLAN_SOIL_RECV	
	RECOV_TOTAL	HOLE_INTERVAL	HI_ACT_SOIL_RECV	
	SMP_END_DEPTH	HOLE_INTERVAL	HI_END_DPTH■	
	SMP_STRT_DEPTH	HOLE_INTERVAL	HI_BEG_DPTH■	
	VISUAL_DESC	HOLE_INTERVAL	HI_VSUAL DESC	OREIS char(200)—WAG6 Char(80)
LOCATION	D_ADDED■	OREIS ASSIGNED		
	LOCATION_ID■	OREIS ASSIGNED		
	TRANS_ID■	OREIS ASSIGNED		
	COMMENTS			
	D_MODIFIED	OREIS ASSIGNED		
	EASTING	MONIT_LOCATION	ML_EASTING	OREIS Num(10,2)—WAG6 Num(8,2)
	ELV_ERROR	MONIT_LOCATION	ML_ELEV_MEAS_ERR	
	ELV_METHOD	MONIT_LOCATION	ML_ELEV_MEAS_METH	Descriptions for code in OREIS CODE table where CODETYPE = ELV_METHOD
	GRID_SYS	MONIT_LOCATION	ML_GRID_SYSTEM	Descriptions for code in OREIS CODE table where CODETYPE = GRID_SYS

■ MANDATORY FIELD - Required by parent database.

OREIS - WAG6/CRRI MAPPING
OREIS DATA MODEL

OREIS		WAG6		
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	GRND_ELV	MONIT_LOCATION	ML_GND_ELEV	
	LATITUDE	MONIT_LOCATION	ML_LATITUDE	
	LONGITUDE	MONIT_LOCATION	ML_LONGITUDE	
	NORTHING	MONIT_LOCATION	ML_NORTHING	OREIS Num(10,2)—WAG6 Num(8,2)
	SITE			
	STA_DESC	MONIT_LOCATION	ML_DESC	
	STA_ERROR	MONIT_LOCATION	ML_MEAS_ERR■	OREIS Char(10)—WAG6 Num(8,2)
	STA_METHOD	MONIT_LOCATION	ML_MEAS_METH	
	SWMU			
METHOD	ANA_METHOD■	REGULATORY_METHOD	REG_METH_ID■	OREIS Char(18)—WAG6 Char(25)
	D_ADDED■	OREIS ASSIGNED		
	TRANS_ID■	OREIS ASSIGNED		
	D_MODIFIED	OREIS ASSIGNED		
	METHOD_NAME	REGULATORY_METHOD	REG_METH_DESC■	
	SOURCE			
METHOD_TYPE	ANA_METHOD■	SAMPLE_TEST	REG_METH_ID■	OREIS Char(18)—WAG6 Char(25)
	ANA_TYPE■	PT_ANLY_CAT_MATRIX	PARAM_ANLY_GRP_COD■	
	D_ADDED■	OREIS ASSIGNED		
	PARAMTR■	LAB_TEST_PARAMETER	PARAM_CODE■	
	TRANS_ID■	OREIS ASSIGNED		
	D_MODIFIED	OREIS ASSIGNED		
PARAMETER	D_ADDED■	OREIS ASSIGNED		
	PARAMTR■	PARAMETER	PARAM_CODE■	
	TRANS_ID■	OREIS ASSIGNED		
	ANA_TYPE	PT_ANLY_CAT_MATRIX	PARAM_ANLY_GRP_COD■	
	CAS_NUM	PARAMETER	PARAM_CAS_ID■	
	CHEMICAL_NAME	PARAMETER	PARAM_STD_NAM	
	D_MODIFIED	OREIS ASSIGNED		

■ MANDATORY FIELD - Required by parent database.

OREIS - WAG6/CRRI MAPPING
OREIS DATA MODEL

OREIS		WAG6		
Table	**Attribute**	**Table**	**Attribute**	**Comment**
PROJECT	D_ADDED■	OREIS ASSIGNED		
	PROJECT_ID■	OREIS ASSIGNED		
	TRANS_ID■	OREIS ASSIGNED		
	ADS_NAME	ENV_PROJECT	EP_ADS_NAM■	
	ADS_NUM	ENV_PROJECT	EP_ADS_NO■	
	COMMENTS	ENV_PROJECT	EP_COMMENT	
	D_COMPLETED	ENV_PROJECT	EP_END_DTE	
	D_INITIATED	ENV_PROJECT	EP_BEG_DTE■	
	D_MODIFIED	OREIS ASSIGNED		
	OU	ENV_PROJECT	EP_OU_ACRONYM■	
	PROJ_CODE	ENV_PROJECT	EP_ID■	
		ENV_PROJECT_TASK	EP_ID■	
		ENV_PROJ_TASK_LOC	EP_ID■	
		FIELD_MEASUREMENT	EP_ID■	
		MONITORING_EVENT	EP_ID■	
	PROJ_DESCRIPTION	ENV_PROJECT	EP_DESC	
	PROJ_NAME	ENV_PROJECT	EP_NAM■	
	PROJ_PROGRAM	ENV_PROJECT	EP_RQMT_SRCE_ID■	OREIS Char(8)—WAG6 CHAR(5)
	PROJ_SITE			
	SITE_NAME			
	SPONSOR	ENV_PROJECT	EP_SPON■	
QC_FLD_SMP	D_ADDED■	OREIS ASSIGNED		
	QC_FLD_SMP_ID■	SAMPLE	SMPL_GEN_HIST_ID	
	TRANS_ID■	OREIS ASSIGNED		
	COMMENTS	SAMPLE	SMPL_COMMENT	
	DEPTH_WATER			
	D_COLLECTED	SAMPLE	SMPL_DTE	
	D_MODIFIED			

■ MANDATORY FIELD - Required by parent database.

OREIS - WAG6/CRRI MAPPING
OREIS DATA MODEL

OREIS		WAG6		
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	INTERVAL			
	MED_TYPE	SAMPLE	MATRX_TYP_CODE	OREIS Char(2)—WAG6 char(5)This WAG6 field will contain a 2 char code depending upon the value set in MATRIX_TYPE .MATRX_FLD_LAB_CODE in WAG6
	PURGED_VOL	PURGE_EVENT	PURG_EVT_PURG_VOL■	OREIS Num(8,2)—WAG6 Num(8)
	SAMPLE_ID	SAMPLE	SMPL_HIST_ID■	
	SMP_END_DEPTH	SAMPLE	SMPL_END_INTV	
	SMP_LEVEL			
	SMP_METHOD	SAMPLE	SMPLR_TYP_CODE■	OREIS Char(10)—WAG6 Char(3)
	SMP_PREP	SAMPLE	SMPL_PROC_TYP_CODE	OREIS CHAR(2)—WAG6 Char(15)
	SMP_STRT_DEPTH	SAMPLE	SMPL_BEG_INTV	
	SMP_TYPE	SAMPLE	SMPL_TYP_CODE■	
	T_COLLECTED	SAMPLE	SMPL_TIME	
	WAG6_SMPL_ID	SAMPLE	SMPL_ID	
STATION	D_ADDED■	OREIS ASSIGNED		
	LOCATION_ID■	OREIS ASSIGNED		
	PROJECT_ID■	OREIS ASSIGNED		
	STATION_ID■	OREIS ASSIGNED		
	STA_NAME■	MONIT_LOCATION	ML_ID■	OREIS Char(15)—WAG6 Char(9)
	TRANS_ID■	OREIS ASSIGNED		
	COMMENTS	MONIT_LOCATION	ML_COMMENT	
	D_DISCONTINUED	MONIT_LOC_SRVC	MLSP_END_DTE	
	D_ESTABLISHED	MONIT_LOC_SRVC	MLSP_BEG_DTE■	
	D_MODIFIED	OREIS ASSIGNED		
	STA_GROUP	AREA_GROUP	AREA_GRP_ID■	OREIS Char(30)—WAG6 Char(9)
	STA_STATUS	MONIT_LOCATION	ML_STAT_CODE	
	STA_TYPE	MONIT_LOCATION	ML_TYP	
WELL	D_ADDED■	OREIS ASSIGNED		
	STATION_ID■	OREIS ASSIGNED		

■ MANDATORY FIELD - Required by parent database.

OREIS - WAG6/CRRI MAPPING
OREIS DATA MODEL

OREIS		WAG6		
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	TRANS_ID■	OREIS ASSIGNED		
	WELL_ID■			
	COMMENTS	WELL	WELL_COMMENT	
	CUSTODIAN			
	D_CONSTRUCTED			
	D_MODIFIED	OREIS ASSIGNED		
	D_STATUS			
	MP_ELV	WELL_MOD_EVENT	WELL_MOD_MEAS_ELEV	
		WELL_INSTALL_EVENT	WI_MEAS_ELEV	
	REFERENCE			
	SMP_METHOD	SAMPLE	SMPLR_TYP_CODE■	OREIS Char(10)—WAG6 Char(3)
	WELL_DEPTH	WELL	WELL_CONSTR_DPTH■	OREIS Char(8)—WAG6 Char(8,2)
	WELL_STATUS	MONIT_LOCATION	ML_STAT_CODE	OREIS Char(1)—WAG6 Char(2)
	WELL_TYPE	WELL	WELL_TYP	
	WELL_USE			
WELLCONS	D_ADDED■	OREIS ASSIGNED		
	TRANS_ID■	OREIS ASSIGNED		
	WELL_ID■			
	AQUIFER	WELL	WELL_AQUIFIER	
	COMMENTS	WELL_INSTALL_EVENT	WI_COMMENT	
	CONTRACTOR	WELL_INSTALL_EVENT	WI_CONST_CONTCTR	
	DEV_CONDUCT			
	DEV_METHOD			
	DEV_VOLUME	PURGE_EVENT	PURG_EVT_PURG_VOL■	OREIS Num(8,2)—WAG6 Num(8)
	DRILL_EQUIP	DRILL_EVENT	DE_EQUP_TYP	
	D_COMPLETED	WELL_INSTALL_EVENT	WI_COMPL_DTE■	
	D_MODIFIED	OREIS ASSIGNED		
	D_PLUGGED	PLUGGING_EVENT	PLUG_EVT_DTE■	
	FLTR_BOT_DEPTH	WELL_COMPONENT	WELL_COMP_BOT_DPTH	Where Component = Filter
	FLTR_MAT	WELL_COMPONENT	COMP_MATL_CODE	Where Component = Filter

■ MANDATORY FIELD - Required by parent database.

OREIS - WAG6/CRRI MAPPING
OREIS DATA MODEL

OREIS		WAG6		
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	FLTR_TOP_DEPTH	WELL_COMPONENT	WELL_COMP_TOP_DPTH	Where Component = Filter
	FORMATION_NAME			
	GEO_UNIT			
	GROUP_NAME			
	GROUT	WELL	WELL_GROUT	
	MON_TYPE			
	PAD_MAT	WELL_COMPONENT	COMP_MATL_CODE	Where Component = PAD
	PC_BOT_DEPTH	WELL_COMPONENT	WELL_COMP_BOT_DPTH	Where Component = Protective Casing
	PC_DIAM	WELL_COMPONENT	WELL_COMP_INS/OUT_DIAM	Where Component = Protective Casing
	PC_MAT	WELL_COMPONENT	COMP_MATL_CODE	Where Component = Protective Casing
	PC_TOP_DEPTH	WELL_COMPONENT	WELL_COMP_TOP_DPTH	Where Component = Protective Casing
	PERMIT_NUMBER	WELL	WELL_PERMIT_NO	
	PLUG_MAT	PLUG_INTV_MATERIAL	PLUG_MATL_CODE■	
	PLUG_TOP_DEPTH	PLUG_INTV_MATERIAL	PLUG_INTV_BEG_DPTH	
	PURGE_METH	PURGE_EVENT	PURGE_METH_CODE■	
	P_A_METHOD	PLUG_INTV_MATERIAL	PLUG_METH_NAM	
	QA_INDICATOR			
	ROCK_DEPTH			
	SCRN_BOT_DEPTH	WELL_COMPONENT	WELL_COMP_BOT_DPTH	Where Component =SCEEN
	SCRN_DIAM	WELL_COMPONENT	WELL_COMP_INS/OUT_DIAM	Where Component =SCEEN
	SCRN_MAT	WELL_COMPONENT	COMP_MATL_CODE	Where Component =SCEEN
	SCRN_SLT_SZ	WELL_COMPONENT	WELL_COMP_SLOT_SIZ	OREIS Num(6,2)—WAG6 NUM(8)
				Where Component =SCEEN
	SCRN_TOP_DEPTH	WELL_COMPONENT	WELL_COMP_TOP_DPTH	Where Component =SCEEN
	SC_BOT_DEPTH	WELL_COMPONENT	WELL_COMP_BOT_DPTH	Where Component =SURFACE_CASING
	SC_DIAM	WELL_COMPONENT	WELL_COMP_INS/OUT_DIAM	Where Component =SURFACE_CASING
	SC_MAT	WELL_COMPONENT	COMP_MATL_CODE	Where Component =SURFACE_CASING
	SC_TOP_DEPTH	WELL_COMPONENT	WELL_COMP_TOP_DPTH	Where Component =SURFACE_CASING
	SEAL_MAT	WELL_COMPONENT	COMP_MATL_CODE	Where Component =SEAL
	SEAL_TOP_DEPTH	WELL_COMPONENT	WELL_COMP_TOP_DPTH	Where Component =SEAL
	TRANSMIS	WELL	WELL_TRNSMSVTY	

■ MANDATORY FIELD - Required by parent database.

OREIS - WAG6/CRRI MAPPING
OREIS DATA MODEL

OREIS		WAG6		
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	WATER_DEPTH	WELL	WELL_INIT_WTR_DPTH	
	WATER_ELV			
	WC_BOT_DEPTH	WELL_COMPONENT	WELL_COMP_BOT_DPTH	Where Component =WELL_CASING
	WC_DIAM	WELL_COMPONENT	WELL_COMP_INS/OUT_DIAM	Where Component =WELL_CASING
	WC_MAT	WELL_COMPONENT	COMP_MATL_CODE	Where Component =WELL_CASING
	WC_TOP_DEPTH	WELL_COMPONENT	WELL_COMP_TOP_DPTH	Where Component =WELL_CASING
	WELL_DIAM	HOLE_INTERVAL	HI_DIAM	
	WELL_TYPE			
	WELL_USE			
ALIAS_SOURCE	D_ADDED			
	OREIS_COLUMN■			
	OREIS_TABLE■			
	SOURCE_COLUMN■			
	SOURCE_TABLE■			
	TRANS_ID■	OREIS ASSIGNED		
	COMMENTS			
	D_MODIFIED	OREIS ASSIGNED		
	SOURCE_UNITS			
ASSOCIATE_QC	D_ADDED■	OREIS ASSIGNED		
	FLD_SMP_ID■	OREIS ASSIGNED		
	QC_FLD_SMP_ID■	OREIS ASSIGNED		
	TRANS_ID	OREIS ASSIGNED		
	D_MODIFIED	OREIS ASSIGNED		
BIOTA	BIOTA_ID■	OREIS ASSIGNED		
	D_ADDED■	OREIS ASSIGNED		
	PARAMTR■			
	STATION_ID■	OREIS ASSIGNED		
	TRANS_ID■	OREIS ASSIGNED		

■ MANDATORY FIELD - Required by parent database.

OREIS Tables Not Included in WAG6

January 27, 1994

Table	Attribute	
	COMMENTS	
	COM_NAME	
	DATAQUAL	
	D_COLLECTED	
	D_MODIFIED	OREIS ASSIGNED
	LENGTH	
	NUM_SAMPLED	
	ORGANISM_GROUP	
	RAD_ERR	
	RESULTS	
	RSLTQUAL	
	SEX	
	SMP_DEVICE	
	SMP_METHOD	
	SMP_TYPE	
	SPECIES	
	T_COLLECTED	
	UNITS	
	VALIDATION	
	WEIGHT	
	D_MODIFIED	OREIS ASSIGNED
CONTACT	D_ADDED■	OREIS ASSIGNED
	TRANS_ID■	OREIS ASSIGNED
	USER_ID■	
	AFFILIATION	
	CITIZEN	
	CITY	
	CLEARANCE	
	COMMENTS	
	COMPILER	
	D_MODIFIED	OREIS ASSIGNED

■ MANDATORY FIELD - Required by parent database.

OREIS Tables Not Included in WAG6

January 27, 1994

Table	Attribute	
	EMAIL	
	FAX	
	FTS	
	INTRST1	
	INTRST2	
	INTRST3	
	NAME	
	ORGANIZATION	
	PHONE	
	PLANT_AD	
	PROFILE	
	PROJECT_CODE	
	ROLE	
	SITE	
	STATE	
	STREET	
	TERM_TYPE	
	UPDATE_PRIV	
	ZIP	
DATASET	DATASET_ID■	OREIS ASSIGNED
	D_ADDED■	OREIS ASSIGNED
	CAUTIONS	
	DESCRIPTION	
	DOCUMENTER	
	D_COMPILED	
	D_MODIFIED	OREIS ASSIGNED
	FOLDER	
	FOOTNOTE	
	GEOGRAPHIC	
	MISSVAL	
	QUALIFIERS	
	REPORTS	

■ MANDATORY FIELD - Required by parent database.

OREIS Tables Not Included in WAG6

January 27, 1994

Table	Attribute	
	RMC_ID	
	TEMPORAL	
TRANSMITTAL	DATASET_ID■	OREIS ASSIGNED
	D_ADDED■	OREIS ASSIGNED
	TRANS_ID■	OREIS ASSIGNED
	COMMENTS	
	COMPILER	
	CONVERT	
	CUSTODIAN	
	DATA_FORMAT	
	D_MODIFIED	OREIS ASSIGNED
	D_RECEIVED	
	D_TRANSMITTED	
	FOLDER	
	GENERATOR	
	MEDIUM_DESCRIPTION	
	NUM_LOADED	
	NUM_SUBMIT	
	PROBLEMS	
	PROGRAM	
	RESOLUTION	

■ MANDATORY FIELD - Required by parent database.

Appendix F

IMS MAPPING TO OREIS VERSION 2.0

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

January 27, 1994

WAG6		OREIS		
Table	**Attribute**	**Table**	**Attribute**	**Comment**
ACTION_LIMIT	ACT_LIM_CLOSED_DTE■			
	ACT_LIM_EFFECT_DTE■			
	ACT_LIM_UNIT■			
	ACT_LIM_VAL■			
	☛PARAM_CODE■			
	☛MATRX_TYP_CODE■			
	☛EP_ID■			
	☛ENV_PROJ_TASK_CODE■			
AREA_GROUP	AREA_GRP_NAM			
	AREA_GRP_TYP			
	AREA_GRP_DESC			
	AREA_GRP_ID■	STATION	STA_GROUP	OREIS Char(30)—WAG6 Char(9)
AREA_GRP_LOCATION	AG_LOC_BEG_DTE■			
	AG_LOC_END_DTE			
	AG_LOC_PURG_SEQ			
	☛ML_ID■			
	☛AREA_GRP_ID■			
BADGED_PERSON	BDGD_PRSN_UID			
	BDGD_PRSN_LAST_NAM■			
	BDGD_PRSN_MID_NAM			
	BDGD_PRSN_FRST_NAM■			
	BDGD_PRSN_BADGE_NO■			
BORE_HOLE	BH_PERMIT_NO■	BORECONS	PERMIT_NUMBER	
	BH_ROCK_CORE_DESC			
	BH_DRAW_NO			
	BH_RPT_NO			

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

WAG6		OREIS		January 27, 1994
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	BH_RPT_TITLE			
	BH_RPT_DRAW_DTE			
	BH_COMMENT	BORECONS	COMMENTS	
	BH_CONV_WELL_FLG■			
	BH_DPTH■	BORECONS	BORE_DEPTH	
	BH_ROCK_DPTH■			
	BH_INIT_WTR_DPTH■	BORECONS	WATER_DEPTH	
	BH_DIAM_UNIT■			Defined as inches by HOLE_DIAMETER
	BH_DIAM■	BORECONS	HOLE_DIAM	
	☛ML_ID■	BORECONS	WELL_ID■	OREIS Num(8)—WAG6 Char(9)
	☛GEO_FORM_CODE■			
COMPANY	CO_NAME			
	CO_CODE			
COMPONENT_TYPE	COMP_TYP_CODE■			
	COMP_TYP_NAME■			
COMP_MATERIAL	COMP_MATL_CODE■			
	COMP_MATL_NAM■			
COMP_TYP_MATERIAL	COMP_TYP_MATL_DTE			
	☛COMP_MATL_CODE■			
	☛COMP_TYP_CODE■			
DATA_FORM	FRM_DOC_MGT_CTL_NO			
	FRM_TYP■			
	FRM_NO■			

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

WAG6		OREIS		January 27, 1994
Table	**Attribute**	**Table**	**Attribute**	**Comment**
DATA_USE_QUALIFIER	DATA_USE_QUAL_CODE■	CODE	CODE	OREIS CODE table where CODETYPE = DATAQUAL. OREIS Char(10)—WAG6 char(4)
	DATA_USE_QUAL_DESC	CODE	DESCRIPTION	OREIS code table where codetype = DATAQUAL
DATA_XFER_FILE	DATA_XFER_FILE_NAM			
DRILLING_EVENT	DE_COMMENT			
	DE_TOT_DEVIAT■			
	DE_DEVIAT_METH■			
	DE_AUGR_REFSL_ELEV			
	DE_GEO_LOG_FLG			
	DE_CMPLT_DTE	BORECONS	D_COMPLETED	
	DE_EQUP_TYP■	BORECONS	DRILL_EQUIP	
		WELLCONS	DRILL_EQUIP	
	DE_EQUP_MAK■			
	DE_GEO_CONTCTR■			
	DE_CONTCTR■	BORECONS	CONTRACTOR	
	DE_GEOGLST_NAM■			
	DE_BEG_DTE■	BORECONS	D_STARTED	
	☛EP_ID■			
	☛ENV_PROJ_TASK_CODE■			
	☛ML_ID■			
	☛ME_BEG_DTE■			
	☛ME_SEQ_NO■			
DRILLING_METHOD	DRILL_METH_DESC■	CODE	DESCRIPTION	OREIS CODE table where CODETYPE = CONS_METHOD.
	DRILL_METH_CODE■	CODE	CODE	OREIS CODE table where CODETYPE = CONS_METHOD.
ENV_MON_LOC_FLOW	EMLF_MIN_RATE			
	EMLF_MAX_RATE			

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

January 27, 1994

WAG6		OREIS		
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	EMLF_TIME■			
	EMLF_RATE■			
	EMLF_DTE■			
	EMLF_CONV_MIN_RATE			
	EMLF_CONV_MAX_RATE			
	EMLF_METH_CODE■			
	EMLF_CONV_RATE■			
	EMLF_UNIT_ABBR■			
	EMLF_CONV_UNT_ABBR■			
	☛ML_ID■			
ENV_PROJECT	EP_COMMENT	PROJECT	COMMENTS	
	EP_SPON■	PROJECT	SPONSOR	
	EP_OU_ACRONYM■	PROJECT	OU	
	EP_ADS_NO■	PROJECT	ADS_NUM	
	EP_ADS_NAM■	PROJECT	ADS_NAME	
	EP_RQMT_SRCE_ID■	PROJECT	PROJ_PROGRAM	OREIS Char(8)—WAG6 Char(5)
	EP_NAM■	PROJECT	PROJ_NAME	
	EP_END_DTE	PROJECT	D_COMPLETED	
	EP_BEG_DTE■	PROJECT	D_INITIATED	
	EP_ID■	PROJECT	PROJ_CODE	Populate with "WAG6"
	EP_DESC	PROJECT	PROJ_DESCRIPTION	
ENV_PROJECT_TASK	ENV_PROJ_TASK_DESC			
	ENV_PROJ_TASK_CODE■			Populate with code "HD" for Historical
	☛EP_ID■	PROJECT	PROJ_CODE	
ENV_PROJ_TASK_LOC	ENV_PROJ_TASK_DTE			
	☛ML_ID■	LOCATION	SITE	OREIS Char(10)—WAG6 Char(9)
	☛EP_ID■	PROJECT	PROJ_CODE	

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

WAG6		OREIS		January 27, 1994
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	☛ENV_PROJ_TASK_CODE■			"HD" carried from ENV_PROJECT_TASK
EQUP_CALB_EVENT	EQUP_CALB_SEQ_NO■			
	EQUP_CALB_TYP■			
	EQUP_CALB_TIME			
	EQUP_CALB_COMMENT			
	EQUP_CALB_DTE■			
	☛EQUP_ID■			
EQUP_CALB_EVT_FRM	EQUP_CALB_FRM_DTE			
	☛FRM_NO■			
	☛FRM_TYP■			
	☛EQUP_ID■			
	☛EQUP_CALB_DTE■			
	☛EQUP_CALB_SEQ_NO■			
EQUP_CALB_RESULT	CALB_RSLT_COMMENT			
	EQUP_CALB_FLG■			
	EQUP_CALB_TEMP■			
	EQUP_CALB_PARAM■			
	CALB_RSLT_SEQ_NO■			
	EQUP_CALB_UNIT■			
	EQUP_CALB_VAL■			
	☛EQUP_ID■			
	☛EQUP_CALB_DTE■			
	☛EQUP_CALB_SEQ_NO■			
EQUP_INIT_EVT_FRM	EQUP_INIT_FRM_DTE			
	☛FRM_NO■			
	☛FRM_TYP■			
	☛EQUP_ID■			

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

WAG6		OREIS		January 27, 1994
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	☛ML_ID■			
	☛EL_INIT_DTE■			
EQUP_INSP_EVENT	EQUP_INSP_COMMENT			
	EQUP_INSP_DTE■			
	☛EQUP_ID■			
EQUP_INSP_EVT_FRM	EQUP_INSP_FRM_DTE			
	☛FRM_NO■			
	☛FRM_TYP■			
	☛EQUP_ID■			
	☛EQUP_INSP_DTE■			
EQUP_LOC_INIT_EVT	EL_INIT_COMMENT			
	EL_INIT_TIME■			
	EL_INIT_DTE■			
	☛EQUP_ID■			
	☛ML_ID■			
EQUP_LOC_REM_EVENT	EL_REM_COMMENTS			
	EL_REM_TIME■			
	EL_REM_DTE■			
	☛EQUP_ID■			
	☛ML_ID■			
	☛EL_INIT_DATE■			
EQUP_REM_EVT_FRM	EQUP_REM_FRM_DTE			
	☛FRM_NO■			
	☛FRM_TYP■			
	☛EQUP_ID■			
	☛ML_ID■			

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

WAG6		OREIS		January 27, 1994
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	☛EL_REM_DTE■			
EQUP_REPAIR_EVENT	EQUP_REPR_EVT_DTE■			
	EQUP_REPR_RET_DTE			
	EQUP_REPR_COMMENT			
	EQUP_REPR_SND_DTE			
	☛EQUP_ID■			
	☛FRM_NO■			
	☛FRM_TYP■			
EXCEPTION_EVENT	EXCEPT_EVT_DESC			
	EXCEPT_EVT_YEAR■			
	EXCEPT_EVT_NO■			
	EXCEPT_EVT_SEV_COD■			
	EXCEPT_EVT_DET_DTE■			
	☛SMPL_ID■			
	☛SMPL_PROCED_REV■			
	☛SMPL_PROCED_NO■			
	☛ML_ID■			
	☛MONIT_FREQ_CODE■			
	☛PARAM_CODE■			
	☛SAP_ELE_ACT_DTE■			
	☛ME_SEQ_NO■			
	☛ME_BEG_DTE■			
	☛ENV_PROJ_TASK_CODE■			
	☛EP_ID■			
	☛FM_SEQ_NO■			
	☛FM_DTE_COLL■			
	☛SMPL_TST_ASSOC_TYP■			
	☛SMPL_TST_ASSOC_ID■			

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

WAG6		OREIS		January 27, 1994
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	☛SMPL_TST_SEQ_NO■			
	☛REG_METH_ID■			
	☛REG_METH_AGENCY■			
	☛LAB_TST_ID■			
	☛LAB_TST_TYP■			
	☛SR_ID■			
	☛SR_SEQ_NO■			
EXTERNAL_QC_SAMPLE	EQCS_EPA_ID			
	EQCS_QTY_UNIT			
	EQCS_QTY_VAL			
	EQCS_ID■			
	☛LAB_CODE■			
	☛SMPL_ID■			
	☛MATRX_TYP_CODE■			
	☛LAB_CODE■			
	☛EQCS_ID■			
	☛QCT_CODE■			
FIELD_COC	FIELD_COC_DTE			

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

WAG6		OREIS		January 27, 1994
Table	**Attribute**	**Table**	**Attribute**	**Comment**
FIELD_EQUIPMENT	EQUP_RETIRED_DTE			
	EQUP_COMMENT			
	EQUP_MFG_NAM■			
	EQUP_BADGE_NO■			
	EQUP_BEG_DTE■			
	EQUP_MODEL_NO■			
	EQUP_TYP■			
	EQUP_STAT_CODE■			
	EQUP_LAST_CALB_DTE			
	EQUP_ID■			
	EQUP_MFG_SER_NO■			
FIELD_MEASUREMENT	FM_LOG_ID			
	FM_LOG_BEG_PGE_NO			
	FM_DATA_USE_QUAL	FLD_MEAS	DATAQUAL	
	FM_RSLT_VALID_QUAL			
	FM_RSLT_QUAL	FLD_MEAS	RSLTQUAL	
	FM_BADGE_NO■			Mandatory ??
	FM_DEPTH_UNIT			
	FM_DEPTH	FLD_EVENT	SMP_LEVEL	
	FM_COMMENT	FLD_MEAS	COMMENTS	
	FM_DTE_COLL■	FLD_EVENT	D_COLLECTED	
	FM_TIME_COLL	FLD_MEAS	T_COLLECTED	
	FM_RPT_RSLT■	FLD_MEAS	RESULTS	OREIS Num(38,10)—WAG6 Char(8)
	FM_RPT_UNIT■	FLD_MEAS	UNITS	OREIS Char(10)—WAG6 Char(18)
	FM_INIT_FNL_INDCTR			Delete ??
	FM_CONV_RPT_RSLT			
	FM_CONV_UNIT			
	FM_SEQ_NO■			Populate with numeric value 1.
	FM_REVISED_FLAG			

■ MANDATORY FIELD - Required by parent database.
➡ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

January 27, 1994

WAG6 Table	WAG6 Attribute	OREIS Table	OREIS Attribute	Comment
	FM_METH■	FLD_MEAS	SUM_METHOD	OREIS Char(6)—WAG6 Char(10)
	☛PARAM_CODE■			Lookup of OREIS FIELD_MEAS.PARAMTR in previously populated WAG6 PARAMETER table to get WAG6 PARAM_CODE..
		FLD_MEAS	PARAMTR_CODE	
	☛EP_ID■	PROJECT	PROJ_CODE	
	☛ENV_PROJ_TASK_CODE■			Populate with "HD"
	☛ML_ID■			
	☛ME_BEG_DTE■			
	☛ME_SEQ_NO■			
	☛EQUP_ID			
GEOLOGIC_FORMATION	GEO_FORM_NAME■	CODE	DESCRIPTION	OREIS CODE table where CODETYPE = FORMATION_NAME. OREIS Char(80)—WAG6 Char(12)
	GEO_FORM_CODE■	CODE	CODE	OREIS CODE table where CODETYPE = FORMATION_NAME. OREIS Char(10)—WAG6 Char(6)
	☛GEO_GRP_CODE■			
GEOLOGIC_GROUP	GEO_GRP_NAM■	CODE	DESCRIPTION	OREIS CODE table where CODETYPE = GROUP_NAME
	GEO_GRP_CODE■	CODE	CODE	OREIS CODE table where CODETYPE = GROUP_NAME
GPS_LOCATION	GPSL_ID■			
	GPSL_ELLPS_STD_ERR			
	GPSL_LONG_STD_ERR			
	GPSL_LAT_STD_ERR			
	GPSL_ELLPS_HGHT			
	GPSL_LONGITUDE			
	GPSL_LATITUDE			
	☛EP_ID■			
	☛ENV_PROJ_TASK_CODE■			

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

WAG6		OREIS		January 27, 1994
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	☛ML_ID■			
	☛ME_BEG_DTE■			
	☛ME_SEQ_NO■			
HOLE_INTERVAL	HI_ACT_SOIL_RECV■			
	HI_PLAN_SOIL_RECV■			
	HI_ASTM_CODE■	LITHOLOGY	ASTMCODE	
	HI_DIAM_UNIT■			
	HI_DIAM■			
	HI_COMMENT	LITHOLOGY	COMMENTS	
	HI_END_DPTH■	LITHOLOGY	SMP_END_DEPTH	
	HI_BEG_DPTH■	LITHOLOGY	SMP_STRT_DEPTH	
	HI_VSUAL_DESC	LITHOLOGY	VISUAL_DESC	
	☛ME_SEQ_NO■			
	☛ME_BEG_DTE■			
	☛ML_ID■			
	☛ENV_PROJ_TASK_CODE■			
	☛EP_ID■			
	☛DRILL_METH_CODE■			
HOLE_INTERVAL_CHAR	HOLE_INTV_CHAR_DTE			
	☛EP_ID■			
	☛ENV_PROJ_TASK_CODE■			
	☛ML_ID■			
	☛ME_BEG_DTE■			
	☛ME_SEQ_NO■			

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

January 27, 1994

WAG6		OREIS		
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	☛HI_BEG_DPTH■			
	☛INTV_CHAR_TYP_CODE■			
INTERVAL_CHAR_TYPE	INTV_CHAR_TYP_DESC■	CODE	DESCRIPTION	OREIS CODE table where CODETYPE = LITHTYPE
	INTV_CHAR_TYP_NAM■			
	INTV_CHAR_TYP_CODE■	CODE	CODE	OREIS CODE table where CODETYPE = LITHTYPE.
INT_QC_SAMPLE	QC_SMPL_ORIG_CODE■			
	☛SMPL_ID■			
	☛QCT_CODE			
	☛QC_MATL_ID			
KIT	KIT_PREP_DTE■			
	KIT_ID■			
LAB	LAB_ZIP_CODE■			Mandatory ??
	LAB_STATE■			Mandatory ??
	LAB_CITY■			Mandatory ??
	LAB_STREET■			Mandatory ??
	LAB_NAM■	CODE	DESCRIPTION	OREIS CODE table where CODETYPE = LAB_CODE
	LAB_CODE■	CODE	CODE	OREIS CODE table where CODETYPE = LAB_CODE
LAB_COC	LAB_COC_DTE			
LAB_CONTACT	LAB_CONT_PHONE■			
	LAB_CONT_NAM■			
	☛LAB_CODE■			
	☛EP_ID■			
	☛ENV_PROJ_TASK_CODE■			
LAB_INSTRUMENT	LAB_INST_ID■			

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

January 27, 1994

WAG6 Table	WAG6 Attribute	OREIS Table	OREIS Attribute	Comment
	LAB_INST_TYPE■			
	☛LAB_CODE■			
LAB_INSTR_CALB_EVT	LAB_INST_LAST_TIME■			
	LAB_INST_LAST_DTE■			
	LAB_INST_CALB_CAT■			
	LAB_INST_CONC_LVL			
	LAB_INST_GC_COL			
	LAB_INST_GC_COL_ID			
	LAB_INST_CALB_FILE■			
	LAB_INST_CALB_TYP■			
	LAB_INST_CALB_TIME■			
	LAB_INST_CALB_DTE■			
	☛LAB_CODE■			
	☛LAB_INSTR_ID■			
	☛REG_METH_ID■			
	☛REG_METH_AGENCY■			
	☛LAB_TST_ID■			
	☛LAB_TST_TYP■			
LAB_INST_CALB_RSLT	INST_CALB_RSLT_SEQ■			
	INST_CALB_COMMENT			
	INST_CALB_RSLT_TYP■			
	INST_CALB_RSLT_UNT■			
	INST_CALB_RSLT_VAL■			
	☛LAB_INSTR_ID■			
	☛LAB_CODE■			
	☛LAB_TST_TYP■			
	☛LAB_TST_ID■			
	☛REG_METH_AGENCY■			

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

WAG6		OREIS		January 27, 1994
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	☛REG_METH_ID■			
	☛LAB_INST_CALB_TIME■			
	☛LAB_INST_CALB_DTE■			
	☛PARAM_CODE■			
LAB_TEST	LAB_TST_ID■			
	LAB_TST_NAM■			
	LAB_TST_TYP■			
	LAB_TST_HLD_FLG■			
	LAB_TST_HLD_QTY			
	LAB_TST_HLD_UNIT			
	☛REG_METH_AGENCY■			
	☛REG_METH■			
LAB_TEST_MATRIX	LAB_MATX_HLD_QTY			
	LAB_MATX_HLD_UNIT			
	LAB_MATX_MIN_UNIT■			
	LAB_MATX_MIN_REQD■			
	LAB_MATX_DEF_UNIT			
	☛REG_METH_ID■			
	☛REG_METH_AGENCY■			
	☛LAB_TST_ID■			
	☛LAB_TST_TYP■			
	☛MATRX_TYP_CODE■			

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

WAG6		OREIS		January 27, 1994
Table	**Attribute**	**Table**	**Attribute**	**Comment**
LAB_TEST_PARAMETER	LTP_EPA_METH			
	LTP_SURRGT_FLG■			
	LTP_HLD_UNIT			
	LTP_HLD_QTY			
	☛REG_METH_ID■			
	☛REG_METH_AGENCY■			
	☛LAB_TST_ID■			
	☛LAB_TST_TYP■			
	☛PARAM_CODE■			
LAB_TEST_PARAM_LIM	LAB_TST_DET_LIM	LAB_MEAS	DETECT_LIMIT	OREIS Num(38,10)—WAG6 Num(8)
	LAB_TST_LOW_LIM	CRITERIA	STD_LIMIT	OREIS Num(10,5)—WAG6 Num(8)
	☛MATRX_TYP_CODE■			
	☛LAB_TST_TYP■			
	☛LAB_TST_ID■			
	☛REG_METH_AGENCY■			
	☛REG_METH_ID■			
	☛PARAM_CODE■			
LAB_TEST_QUAL	LAB_TST_CODE■			
	LAB_TST_DESC■			
MATRIX_TYPE	MATRX_LAB_TYP■			Mandatory ??
	MATRX_TYP_DESC■	CODE	DESCRIPTION	OREIS CODE table where CODETYPE = MED_TYPE
	MATRX_TYP_CODE■	CODE	CODE	OREIS CODE table where CODETYPE = MED_TYPE. OREIS Char(10)—WAG6 Char(5)
MEASUREMENT_UNIT	MEAS_UNIT_ABBR■	CODE	CODE	OREIS CODE table where CODETYPE = UNITS
	MEAS_UNIT_NAM■	CODE	DESCRIPTION	OREIS CODE table where CODETYPE = UNITS

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

January 27, 1994

WAG6 Table	WAG6 Attribute	OREIS Table	OREIS Attribute	Comment
MEAS_UNIT_CONV_FAC	MUCF_PREF_UNT_ABBR■			
	MUCF_RPT_UNIT_ABBR■			
	MUCF_RSLT_VAL■			
	MUCF_RSLT_VAL_EXP■			
	☛MEAS_UNIT_ABBR■			
ME_DATA_XFER_FILE	ME_DATA_FILE_DTE			
MONITORING_EVENT	ME_END_TIME			
	ME_END_DTE			
	ME_COMMENT	FLD_EVENT	COMMENTS	
	ME_SEQ_NO■			Populate with numeric value of 1.
	ME_WEATHER			
	ME_BEG_TIME			Populate with "0800"
	ME_BEG_DTE	FLD_EVENT	D_COLLECTED	
	☛ML_ID■	LOCATION	SITE	OREIS Char(10)—WAG6 Char(5)
	☛ENV_PROJ_TASK_CODE■			Populate with "HD"
	☛EP_ID■	PROJECT	PROJ_CODE	
MONITORING_TEAM	MONIT_TEAM_ID			
MONIT_EVT_DATA_FRM	MONIT_DATA_FRM_DTE			
	☛FRM_NO■			
	☛FRM_TYP■			
	☛EP_ID■			
	☛ENV_PROJ_TASK_CODE■			
	☛ML_ID■			
	☛ME_BEG_DTE■			
	☛ME_SEQ_NO■			

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

WAG6		OREIS		January 27, 1994
Table	**Attribute**	**Table**	**Attribute**	**Comment**
MONIT_FREQUENCY	MONIT_FREQ_CODE■			
	MONIT_FREQ_DESC			
MONIT_LOCATIO:	ML_GPS_VAR_CODE			
	ML_MARKER_UNIT			
	ML_MARKER_NO			
	ML_NAM			
	ML_STAT_CODE■	STATION	STA_STATUS	OREIS Char(1)—WAG6 Char(2) Need lookup table for STATUS_CODE (i.e. CODE, DESCRIPTION)
		WELL	WELL_STATUS	
	ML_MEAS_ERR	LOCATION	STA_ERROR	OREIS Char(10)—WAG6 NUM(8,2)
	ML_MEAS_METH	LOCATION	STA_METHOD	
	ML_ELEV_MEAS_METH	LOCATION	ELV_METHOD	Need lookup table Method—Code & Description available in OREIS CODE table where CODETYPE = ELV_METHOD
	ML_ELEV_MEAS_ERR	LOCATION	ELV_ERROR	
	ML_NORTHING	LOCATION	NORTHING	OREIS Num(10,2)—WAG6 Num(8,2)
	ML_EASTING	LOCATION	EASTING	OREIS Num(10,2)—WAG6 Num(8,2)
	ML_GND_ELEV	LOCATION	GRND_ELV	
	ML_COMMENT	STATION	COMMENTS	
	ML_GRID_SYS	LOCATION	GRID_SYS	Need lookup table for GRID SYSTEM—Code & Description available in OREIS CODE table where CODETYPE = GRID_SYS
	ML_DESC	LOCATION	STA_DESCRIPTION	Need lookup table for Location type and description.
	ML_TYPE	STATION	STA_TYPE	
	ML_ID	STATION	STA_NAME	OREIS Char(10)—WAG6 Char(9)
	☛RIVER_ID■			

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

January 27, 1994

WAG6 Table	WAG6 Attribute	OREIS Table	OREIS Attribute	Comment
MONIT_LOC_ALIAS	MLA_BEG_DTE			
	MLA_NAM■			
	MLA_ID■			
	☛ML_ID■			
MONIT_LOC_SRVC_PER	MLSP_COMMENT			
	MLSP_END_DTE	STATION	D_DISCONTINUED	
	MLSP_BEG_DTE■	STATION	D_ESTABLISHED	
	☛ML_ID■			
PARAMETER	PARAM_CODE■	PARAMETER	PARAMTR	
	PARAM_ABBR			
	PARAM_CAS_ID	PARAMETER	CAS_NUM	
	PARAM_STD_NAM	PARAMETER	CHEMICAL_NAME	
PARAM_ANALYSIS_CAT	PARAM_ANLY_CAT_NAM■			
	PARAM_ANLY_CAT_COD■			
PARAM_ANALYSIS_GRP	PARAM_ANLY_GRP_NAM■	CODE	DESCRIPTION	OREIS CODE table where CODETYPE = ANA_TYPE. OREIS Char(10)—WAG6 Char(6)
	PARAM_ANLY_GRP_COD■	CODE	CODE	OREIS CODE table where CODETYPE = ANA_TYPE
PLUGGING_EVENT	PLUG_EVT_DTE■	BORECONS	D_PLUGGED	
		WELLCONS	D_PLUGGED	
	PLUG_EVT_LOC_ID■			
PLUGGING_METHOD	PLUG_METH_NAM■			
	PLUG_METH_DESC■			

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

WAG6		OREIS		January 27, 1994
Table	**Attribute**	**Table**	**Attribute**	**Comment**
PLUG_INTV_MATERIAL	PLUG_INTV_END_DPTH■			
	PLUG_INTV_BEG_DPTH■	WELLCONS	PLUG_TOP_DEPTH	
	☛PLUG_EVT_DTE■			
	☛ML_ID■			
	☛PLUG_MATL_CODE■	WELLCONS	PLUG_MAT	
	☛PLUG_METH_NAM■	WELLCONS	P.A.METHOD	
PLUG_MATERIAL	PLUG_MATL_NAM■	CODE	DESCRIPTION	OREIS CODE table where CODETYPE = PLUG_MAT. OREIS Char(80)—WAG6 Char(50)
	PLUG_MATL_CODE■	CODE	CODE	OREID CODE table where CODETYPE = PLUG_MAT. OREIS Char(10)—WAG6 Char(4)
PRESERVATIVE	PRESERVATIVE_NAM			
	PRESERVATIVE_CODE■			
PT_ANLY_CAT_MATRIX	PT_ANLY_MTRX_DTE			
	☛PARAM_ANLY_CAT_CODE■			
	☛EP_ID■			
	☛ENV_PROJ_TASK_CODE■			
	☛PARAM_ANLY_GRP_COD■			
	☛PARAM_CODE■			
PURGE_EVENT	PURG_EVT_WTR_DISP			
	PURGE_EVT_SEQ_NO■			
	PURGE_EVT_VOL_UNIT■			
	PURGE_EVT_PURG_VOL■	FLD_SMP	PURGED_VOL	OREIS Num(8,2)—WAG6 Num(8)
		QC_FLD_SMP	PURGED_VOL	
		WELLCONS	DEV_VOLUME	

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

WAG6		OREIS		January 27, 1994
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	PURG_EVT_TIME■			
	☛EP_ID■			
	☛ENV_PROJ_TASK_CODE■			
	☛ML_ID■			
	☛MON_EVNT_STRT_DATE■			
	☛ME_SEQ_NO■			
	☛PURG_METH_CODE			
PURGE_METHOD	PURG_METH_DESC■	CODE	DESCRIPTION	OREIS CODE table where CODETYPE = PURG_METH. OREIS Char(10)—WAG6 Char(2)
	PURG_METH_CODE■	CODE	CODE	OREIS CODE table where CODETYPE = PURG_METH.
QC_ANALYTE	QCA_LOW_QUAL_LIM			
	QCA_UP_QUAL_LIM			
	QCA_CONC_UNIT■			
	QCA_CONC_VAL■			
	☛QC_MATL_ID■			
	☛PARAM_CODE■			
QC_MATERIAL	QC_MATL_DESC			
	QC_MATL_ID■			
QC_RESULT	QC_RSLT_UNIT■			
	QC_RSLT_VAL			
	QC_RSLT_DESC			
	☛QCT_CODE■			
	☛QCTC_NAM■			
	☛SMPL_TST_ASSOC_TYP■			
	☛SMPL_TST_ASSOC_ID■			
	☛SMPL_TST_SEQ_NO■			

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRL MAPPING
WAG6 DATA MODEL

WAG6		OREIS		January 27, 1994
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	☛REG_METH_ID■			
	☛REG_METH_AGENCY■			
	☛LAB_TST_ID■			
	☛LAB_TST_TYP■			
	☛PARAM_CODE■			
	☛SR_ID■			
	☛SR_SEQ_NO■			
QC_SMPL_REF_MATL	QCS_FNL_QTY_UNIT■			
	QCS_FNL_QTY			
	QCS_ADD_QTY_UNIT			
	QCS_ADD_QTY_VAL			
	☛REF_MATL_NO■			
	☛LAB_CODE■			
	☛EQCS_ID■			
QC_TYPE	QC_INT_EXT_CODE■			
	QCT_NAM■			
	QCT_CODE■			
QC_TYPE_COMPONENT	QCTC_SIG_DIGIT_QTY■			
	QCTC_DEF_UNIT■			
	QCTC_VAL_FORMAT■			
	QCTC_VAL_LEN■			
	QCTC_VAL_TYPE■			
	QCTC_NAM■			
	☛QCT_CODE■			
REFERENCE_MATERIAL	REF_MATL_DESC			
	REF_MATL_NO■			

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

WAG6		OREIS		January 27, 1994
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	☛REG_METH_ID■			
	☛REG_METH_AGENCY■			
	☛LAB_TST_ID			
	☛LAB_TST_TYP■			
	☛QCT_CODE■			
REF_MATL_ANALYTE	RMA_CONC_UNIT■			
	RMA_CONC_VAL■			
	☛REF_MATL_NO■			
	☛PARAM_CODE■			
REGULATORY_METHOD	REG_METH_AGENCY■			
	REG_METH_ID■	METHOD	ANA_METHOD■	OREIS Char(18)—WAG6 Char(25)
	REG_METH_DESC■	METHOD	METHOD_NAME	
	REG_METH_NAM■			
RIVER	RIVER_NAM■			
	RIVER_ID■			
SAMPLE	SMPL_COMPOSITE FLG■			
	SMPL_BIOTA_STAT			
	SMPL_SPECIES			
	SMPL_PROC_TYP_CODE	LAB_SMP	SMP_PREP	OREIS Char(2)—WAG6 Char(15)
		QC_FLD_SMP	SMP_PREP	
	SMPL_BANK_CODE			
	SMPL_SEDIMENT_TYP			
	SMPL_STAT_CODE■			
	SMPL_INTV_UNIT			
	SMPL_CERT_LOT_NO■			
	SMPL_COLL_EQUP_SER			

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

WAG6		OREIS		January 27, 1994
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	SMPL_DTE	FLD_SMP	D_COLLECTED	
		QC_FLD_SMP	D_COLLECTED	
	SMPL_TIME	FLD_SMP	T_COLLECTED	
		QC_FLD_SMP	T_COLLECTED	
	SMPL_FLD_LOG_BG_PG			
	SMPL_END_INTV	FLD_SMP	SMP_END_DEPTH	
		QC_FLD_SMP	SMP_END_DEPTH	
	SMPL_BEG_INTV	FLD_SMP	SMP_STRT_DEPTH	
		QC_FLD_SMP	SMP_STRT_DEPTH	
	SMPL_ID■	FLD_SMP	WAG6_SMPL_ID	
		QC_FLD_SMP	WAG6_SMPL_ID	
		LAB_SMP	WAG6_SMPL_ID	
	SMPL_HIST_ID	FLD_SMP	SAMPLE_ID	
		QC_FLD_SMP	SAMPLE_ID	
	SMPL_GEN_HIST_ID	FLD_SMP	FLD_SMP_ID	
		QC_FLD_SMP	QC_FLD_SMP_ID	
		LAB_SMP	LAB_SMP_ID	
	SMPL_COMPL_CHK_FLG■			
	SMPL_COMMENT	FLD_SMP	COMMENTS	
		QC_FLD_SMP	COMMENTS	
		LAB_SMP	COMMENTS	
	☞PARAM_ANLY_CAT_CODE■			
	☞KIT_ID■			
	☞SMPL_TYP_CODE■	FLD_SMP	SMP_TYPE	
		QC_FLD_SMP	SMP_TYPE	

■ MANDATORY FIELD - Required by parent database.
☞ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

WAG6		OREIS		January 27, 1994
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	☛SMPLR_TYP_CODE■	FLD_SMP	SMP_METHOD	
		QC_FLD_SMP	SMP_METHOD	
		WELL	SMP_METHOD	
	☛PRESERVATIVE_CODE■			
	☛SMPL_CONT_MATL_COD■			
	☛SMPL_CONT_UNT_ABBR■			
	☛SMPL_CONT_MIN_VOL■			
	☛EP_ID■			"WAG6"
	☛ENV_PROJ_TASK_CODE■			"HD"
	☛ML_ID■			
	☛ME_BEG_DTE			
	☛ME_SEQ_NO■			
	☛SMPL_PROCED_NO■			
	☛SMPL_PROCED_REV■			
	☛MATRX_TYP_CODE■	FLD_SMP	MED_TYPE	
		QC_FLD_SMP	MED_TYPE	
		LAB_SMP	MATRIX	
	☛SMPL_PAIR_TYP_CODE■			
	☛MATRX_PROC_REV_NO			
SAMPLER_TYPE	SMPLR_TYP_DESC■	CODE	DESCRIPTION	OREIS CODE table where CODETYPE = SMP_METHOD. OREIS Char(10)—WAG6 Char(3)
	SMPLR_TYP_CODE■	CODE	CODE	OREIS CODE table where CODETYPE = SMP_METHOD.
SAMPLE_LAB	LAB_SMPL_ID■	LAB_SMP	LAB_SAMPLE_ID	
	LAB_BATCH_ID■			
	☛SMPL_ID■			
	☛LAB_CODE■	LAB_SMP	LAB_CODE	
	☛SDG_NO			
SAMPLE_PAIR_TYPE	SMPL_PAIR_TYP_NAM■			

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

WAG6		OREIS		January 27, 1994
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	SMPL_PAIR_TYP_CODE■			
SAMPLE_RESULT	SR_SEQ_NO■			
	SR_MISD_HLD_TIM_QL			
	SR_OUT_CST_LIM_FLG			
	SR_CNF_LVL_LIM_FLG			
	SR_CONF_LVL			
	SR_PREFIX_QUAL			
	SR_DATA_USE_QUAL	LAB_MEAS	DATA_QUAL	
	SR_COMMENT	LAB_MEAS	COMMENTS	
	SR_TENTV_ID_COMPND			
	SR_REV_COMMENT			
	SR_REV_FLG			
	SR_DILUTION_FAC■	LAB_MEAS	DILU_FAC	OREIS Num(38,10)—WAG6 Num(18,0)
	SR_CONV_UNIT			
	SR_CONV_VAL			
	SR_RPT_UNIT■	LAB_MEAS	UNITS	
	SR_RPT_VAL■	LAB_MEAS	RESULTS	
	SR_ID■			
	☛LAB_TST_TYP■			
	☛LAB_TST_ID■			
	☛REG_METH_ID■			
	☛REG_METH_AGENCY■			
	☛SMPL_TST_SEQ_NO■			
	☛SMPL_TST_ASSOC_ID■			
	☛SMPL_TST_ASSOC_TYP■			
	☛PARAM_CODE■	LAB_MEAS	PARMTR	
SAMPLE_TEST	SMPL_TST_COMMENT			
	SMPL_TST_ASSOC_TYP■			

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

WAG6		OREIS		January 27, 1994
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	SMPL_TST_ASSOC_ID■			
	SMPL_TST_CST			
	SMPL_TST_LAB_FILE			
	SMPL_TST_GC_ID			
	SMPL_TST_GC_COL			
	SMPL_TST_LVL			
	SMPL_TST_COMPL_TIM			
	SMPL_TST_COMPL_DTE			
	SMPL_TST_BATCH_POS			
	SMPL_TST_END_QTY			
	SMPL_TST_QTY_UNIT			
	SMPL_TST_INIT_QTY			
	SMPL_TST_BATCH_NO			
	SMPL_TST_TIME■			
	SMPL_TST_DATE■			
	SMPL_TST_SEQ_NO■			
	☛REG_METH_AGENCY■			
	☛REG_METH_ID■	LAB_MEAS	ANA_METHOD	
	☛LAB_TST_ID■			
	☛LAB_TST_TYP■			
	☛LAB_CODE■			
	☛LAB_INST_ID			
SAMPLE_TYPE	SMPL_TYP_NAM■			??
	SMPL_TYP_DESC■	CODE	DESCRIPTION	OREIS CODE table where CODETYPE = SMP_TYPE
	SMPL_TYP_CODE■	CODE	CODE	OREIS CODE table where CODETYPE = SMP_TYPE
SAMPLE_WASTE_CODE	SMPL_WST_CODE_DTE			
	☛WASTE_CODE_ID■			
	☛SMPL_ID■			

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

WAG6		OREIS		January 27, 1994
Table	**Attribute**	**Table**	**Attribute**	**Comment**
SAMPLING_PROCEDURE	SMPL_PROCED_REV■			
	SMPL_PROCED_DESC■			
	SMPL_PROCED_NO■			
SAP_ELEMENT	SAP_ELE_ACT_DTE■			
	SAP_ELE_INACT_DTE			
	SAP_ELE_DTE■			
	SAP_ELE_ID■			
	☛SMPL_PROCED_NO■			
	☛SMPL_PROCED_REV■			
	☛ML_ID■			
	☛MONIT_FREQ_CODE■			
	☛PARAM_CODE■			
	☛SAP_ID■			
	☛MATRX_TYP_CODE■			
SDG_SHIP_CONTNR	SDG_SHIP_ORD_FRM			
	SDG_TEMP_UNIT■			
	SDG_RCPT_COND■			
	SDG_RCV_TEMP■			
	SDG_SHIP_TEMP■			
	SDG_CONTNR_TYP■			
	SDG_CONTNR_NO■			
	☛SDG_NO■			
SMPL_ANLY_PLAN	SAP_MONIT_PLAN_ID■			
	SAP_ACT_DTE■			
	SAP_ID■			
	☛EP_ID			

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

January 27, 1994

WAG6		OREIS		
Table	**Attribute**	**Table**	**Attribute**	**Comment**
SMPL_ASSOC_FORM	SMPL_ASSOC_FRM_DTE			
	▪SMPL_ID■			
	▪SMPL_DATA_FORM_NO■			
	▪SMPL_DATA_FORM_TYP■			
SMPL_ASSOC_INT_QC	SMPL_ASSOC_QC_DTE			
	▪SMPL_ID■			
SMPL_CONT_TYP	SMPL_CONT_MIN_VOL■			
	SMPL_CONT_UNT_ABBR■			
	SMPL_CONT_MATL_COD■			
SMPL_DELIVERY_GRP	SDG_FIN_RPT_DTE■			
	SDG_RPT_DUE_DTE■			
	SDG_EPA_CASE_NO■			
	SDG_ANLY_REQD_DTE■			
	SDG_LAB_SHP_DTE■			
	SDG_LAB_RCD_DTE■			
	SDG_SHP_CONT_NO			
	SDG_NO■	LAB_SMP	STG_NUM	
SMPL_REQUIREMENT	SMPL_RQMT_ID■			
	▪PRESERVATIVE_CODE■			
	▪SMPL_CONT_MATL_COD■			
	▪SMPL_CONT_UNT_ABBR■			
	▪SMPL_CONT_MIN_VOL■			
	▪SMPL_PROCED_REV■			
	▪SMPL_PROCED_NO■			
	▪ML_ID■			
	▪MONIT_FREQ_CODE■			

■ MANDATORY FIELD - Required by parent database.
▪ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

WAG6		OREIS		January 27, 1994
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	☛PARAM_CODE■			
	☛SAP_ELE_ACT_DTE■			
SMPL_RSLT_QUAL	SMPL_RSLT_QUAL_DTE			
	☛SMPL_TST_ASSOC_TYP■			
	☛SMPL_TST_ASSOC_ID■			
	☛SMPL_TST_SEQ_NO■			
	☛REG_METHOD_ID■			
	☛REG_METH_AGENCY■			
	☛LAB_TST_ID■			
	☛LAB_TST_TYP■			
	☛PARAM_CODE■			
	☛SR_ID■			
	☛SR_SEQ_NO■			
	☛VLD_RSLT_QUAL■			
	☛VLD_RSLT_QUAL_TYP■			
SOW_METHOD	SOW_METH_ID			
SOW_METH_PARAM	SOW_METH_PARAM_DTE			

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

January 27, 1994

WAG6		OREIS		
Table	**Attribute**	**Table**	**Attribute**	**Comment**
STATEMENT_OF_WORK	SOW_MAX_SMPL■			
	SOW_FUND_AMT■			
	SOW_PURCH_REQ_NO■			
	SOW_CHARGE_NO■			
	SOW_APO_NO■			
	SOW_NO■			
	☛EP_ID■			
	☛ENV_PROJ_TASK_CODE■			
TEAM_MEMBER_ROLE	TEAM_MEM_ROLE_DTE			
TEAM_ROLE	TEAM_ROLE_NAM			
	TEAM_ROLE_CODE			
TEST_PARAM_QC_LIM	TPQC_CRI_UNIT■			
	TPQC_LOW_LIM_VAL			
	TPQC_UP_LIM_VAL			
	☛LAB_TST_TYP■			
	☛LAB_TST_ID■			
	☛REG_METH_AGENCY■			
	☛REG_METH_ID■			
	☛PARAM_CODE■			
	☛QCT_CODE■			
	☛QCTC_NAM■			
USGS_WEIR_FLOW	WEIR_STD_FLOW_VAL■			
	WEIR_FLOW_HGT_VAL■			
	WEIR_FLOW_REC_DTE■			
	WEIR_FLOW_REC_TIME■			
	WEIR_FLOW_VERF_FLAG■			

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

WAG6		OREIS		January 27, 1994
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	WEIR_REC_BADGE_NO■			
	☛ML_ID■			
VALID_RSLT_QUAL	VLD_RSLT_QUAL_TYP■	CODE	CODE	OREIS CODE table where CODETYPE = RSLTQUAL
	VLD_RSLT_QUAL_DESC■	CODE	DESCRIPTION	OREIS CODE table where CODETYPE = RSLTQUAL
	VLD_RSLT_QUAL■			
WASTE_CODE	WASTE_CODE_ID■			
	WASTE_CODE_DESC■			
WELL	WELL_USE■	WELLCONS	WELL_USE	
		WELL	WELL_USE	
	WELL_TRNSMSVTY■	WELLCONS	TRANSMIS	
	WELL_PERMIT_NO■	WELLCONS	PERMIT_NUMBER	
	WELL_ROCK_DPTH■	WELLCONS	ROCK_DEPTH	
	WELL_INIT_WTR_DPTH■	WELLCONS	WATER_DEPTH	
	WELL_TYP■	WELL	WELL_TYPE	Need lookup for Well Type table
		WELLCONS	WELL_TYPE	
	WELL_COMMENT	WELL	COMMENTS	
	WELL_GROUT	WELLCONS	GROUT	
	WELL_CONSTR_DPTH■	WELL	WELL_DEPTH	OREIS Char(10)—WAG6(8,12)
	WELL_GEO_UNIT■	WELLCONS	GEOLOGIC_UNIT	
	WELL_UPRGT_MNT_FLG■			
	WELL_AQUIFIER	WELLCONS	AQUIFIER	
	☛ML_ID■	WELLCONS	WELL_ID■	
		STATION	STA_NAME	

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

January 27, 1994

WAG6		OREIS		
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	☛PLUG_EVT_DTE■			
	☛PLUG_EVT_LOC_ID■			
	☛GEO_FORM_CODE■			
WELL_COMPONENT	WELL_COMP_EVT_ID■			
	WELL_COMP_TOP_DPTH■	WELLCONS	FLTR_TOP_DEPTH	
		WELLCONS	PC_TOP_DEPTH	
		WELLCONS	SCRN_TOP_DEPTH	
		WELLCONS	SC_TOP_DEPTH	
		WELLCONS	SEAL_TOP_DEPTH	
		WELLCONS	WC_TOP_DEPTH	
	WELL_COMP_BOT_DPTH■	WELLCONS	FLTR_BOT_DEPTH	
		WELLCONS	PC_BOT_DEPTH	
		WELLCONS	SCRN_BOT_DEPTH	
		WELLCONS	SC_BOT_DEPTH	
		WELLCONS	WC_BOT_DEPTH	
	WELL_COMP_INS_DIAM■	WELLCONS	PC_DIAM	? INS OR OUT
		WELLCONS	SCRN_DIAM	? INS OR OUT
		WELLCONS	SC_DIAM	? INS OR OUT
		WELLCONS	WC_DIAM	? INS OR OUT
	WELL_COMP_OUT_DIAM■	WELLCONS	PC_DIAM	? INS OR OUT
		WELLCONS	SCRN_DIAM	? INS OR OUT
		WELLCONS	SC_DIAM	? INS OR OUT
		WELLCONS	WC_DIAM	? INS OR OUT
	WELL_COMP_SLOT_SIZE	WELLCONS	SCRN_SLT_SZ	
	WELL_COMP_MFG_NAM■			
	WELL_COMP_REM_DTE■			

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

WAG6		OREIS		January 27, 1994
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	☛COMP_MATL_CODE■	WELLCONS	FLTR_MAT	
		WELLCONS	PC_MAT	
		WELLCONS	SCRN_MAT	
		WELLCONS	SC_MAT	
		WELLCONS	SEAL_MAT	
		WELLCONS	WC_MAT	
	☛COMP_TYP_CODE■			
	☛ME_SEQ_NO■			
	☛ME_BEG_DTE■			
	☛ML_ID■			
	☛ENV_PROJ_TASK_CODE■			
	☛EP_ID■			
WELL_DEV_EVENT	WELL_DEV_COMMENT			
	WELL_DEV_METH■	WELLCONS	DEV_METHOD	OREIS Char(2)—WAG6 Char(10) Well development method description is available in OREIS CODE table where CODETYPE = DEV_METHOD. Need lookup table for METHOD.
	WELL_DEV_END_DTE			
	☛EP_ID■			
	☛ENV_PROJ_TASK_CODE■			
	☛ML_ID■			
	☛ME_BEG_DTE■			
	☛ME_SEQ_NO■			
WELL_INSTALL_EVENT	WI_MEAS_ELEV	WELL	MP_ELV	
	WI_EQUIP_LOG_FLG■			
	WI_COMMENT	WELLCONS	COMMENTS	
	WIL_DEV_LOG_FLG■			
	WI_COMPL_DTE■	WELLCONS	D_CONSTRUCTED	

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

OREIS - WAG6/CRRI MAPPING
WAG6 DATA MODEL

WAG6		OREIS		January 27, 1994
Table	**Attribute**	**Table**	**Attribute**	**Comment**
	WIL_CONST_CONTCTR	WELLCONS	CONTRACTOR	
	☛EP_ID■			
	☛ENV_PROJ_TASK_CODE■			
	☛ML_ID■			
	☛ME_BEG_DTE■			
	☛ME_SEQ_NO■			
WELL_MOD_EVENT	WELL_MOD_ACT■			
	WELL_MOD_COMPL_DTE■			
	WELL_MOD_TYP■			
	WELL_MOD_COMMENT			
	WELL_MOD_MEAS_ELEV	WELL	MP_ELEV	
	☛EP_ID■			
	☛ENV_PROJ_TASK_CODE■			
	☛ML_ID■			
	☛ME_BEG_DTE■			
	☛ME_SEQ_NO■			

■ MANDATORY FIELD - Required by parent database.
☛ FOREIGN KEY FIELD

Appendix G

PHYSICAL DATA STRUCTURES

SQL> DESC AXT.ACTION_LIMIT

Name	Null?	Type
ACT_LIM_CLOSED_DTE		DATE
ACT_LIM_EFFECT_DTE	NOT NULL	DATE
ACT_LIM_UNIT	NOT NULL	VARCHAR2(8)
ACT_LIM_VAL	NOT NULL	NUMBER
PARAM_CODE	NOT NULL	VARCHAR2(9)
MATRX_TYP_CODE	NOT NULL	VARCHAR2(5)
EP_ID	NOT NULL	VARCHAR2(10)
ENV_PROJ_TASK_CODE	NOT NULL	VARCHAR2(5)

SQL> DESC AXT.AREA_GROUP

Name	Null?	Type
AREA_GRP_NAM		VARCHAR2(50)
AREA_GRP_TYP		VARCHAR2(10)
AREA_GRP_DESC		VARCHAR2(25)
AREA_GRP_ID	NOT NULL	VARCHAR2(10)

SQL> DESC AXT.AREA_GRP_LOCATION

Name	Null?	Type
AG_LOC_BEG_DTE	NOT NULL	DATE
AG_LOC_END_DTE		DATE
AG_LOC_PURG_SEQ		NUMBER(8)
ML_ID	NOT NULL	VARCHAR2(10)
AREA_GRP_ID	NOT NULL	VARCHAR2(10)

SQL> DESC AXT.BADGED_PERSON

Name	Null?	Type
BDGD_PRSN_UID		VARCHAR2(3)
BDGD_PRSN_LAST_NAM	NOT NULL	VARCHAR2(20)
BDGD_PRSN_MID_NAM		VARCHAR2(15)
BDGD_PRSN_FRST_NAM	NOT NULL	VARCHAR2(15)
BDGD_PRSN_BADGE_NO	NOT NULL	VARCHAR2(6)

SQL> DESC AXT.BORE_HOLE

Name	Null?	Type
BH_PERMIT_NO	NOT NULL	VARCHAR2(10)
BH_ROCK_CORE_DESC		VARCHAR2(25)
BH_DRAW_NO		VARCHAR2(10)
BH_RPT_NO		VARCHAR2(15)
BH_RPT_TITLE		VARCHAR2(25)
BH_RPT_DRAW_DTE		DATE
BH_COMMENT		VARCHAR2(200)
BH_CONV_WELL_FLG	NOT NULL	VARCHAR2(1)
BH_DPTH	NOT NULL	NUMBER(8,2)
BH_ROCK_DPTH		NUMBER(8,2)
BH_INIT_WTR_DPTH	NOT NULL	NUMBER(8,2)
BH_DIAM_UNIT	NOT NULL	VARCHAR2(8)
BH_DIAM	NOT NULL	NUMBER(8,3)
ML_ID	NOT NULL	VARCHAR2(10)
GEO_FORM_CODE	NOT NULL	VARCHAR2(6)

SQL> DESC AXT.COMPANY

Name	Null?	Type
CO_NAM	NOT NULL	VARCHAR2(50)
CO_CODE	NOT NULL	VARCHAR2(5)

SQL> DESC AXT.COMPONENT_TYPE

Name	Null?	Type
COMP_TYP_NAM	NOT NULL	VARCHAR2(25)
COMP_TYP_CODE	NOT NULL	VARCHAR2(4)

SQL> DESC AXT.COMP_MATERIAL

Name	Null?	Type
COMP_MATL_NAM	NOT NULL	VARCHAR2(25)
COMP_MATL_CODE	NOT NULL	VARCHAR2(4)

SQL> DESC IGI.COMP_TYP_MATERIAL

Name	Null?	Type
COMP_MATL_CODE	NOT NULL	VARCHAR2(4)
COMP_TYP_CODE	NOT NULL	VARCHAR2(4)

SQL> DESC IGI.DATA_FORM

Name	Null?	Type
FRM_DOC_MGT_CTL_NO		VARCHAR2(10)
FRM_TYP	NOT NULL	VARCHAR2(10)
FRM_NO	NOT NULL	VARCHAR2(15)
FRM_CONFIG_CTL_FLG	NOT NULL	VARCHAR2(1)

SQL> DESC AXT.DATA_USE_QUALIFIER

Name	Null?	Type
DATA_USE_QUAL_CODE	NOT NULL	VARCHAR2(4)
DATA_USE_QUAL_DESC	NOT NULL	VARCHAR2(80)

SQL> DESC AXT.DATA_XFER_FILE

Name	Null?	Type
DATA_XFER_FILE_NAM	NOT NULL	VARCHAR2(20)

SQL> DESC AXT.DRILLING_EVENT

Name	Null?	Type
DE_COMMENT		VARCHAR2(200)
DE_TOT_DEVIAT	NOT NULL	VARCHAR2(10)
DE_DEVIAT_METH	NOT NULL	VARCHAR2(30)
DE_AUGR_REFSL_ELEV		NUMBER(8,2)
DE_GEO_LOG_FLG		VARCHAR2(1)
DE_CMPLT_DTE		DATE
DE_EQUP_TYP	NOT NULL	VARCHAR2(25)
DE_EQUP_MAK	NOT NULL	VARCHAR2(25)
DE_GEO_CONTCTR		VARCHAR2(25)
DE_CONTCTR		VARCHAR2(25)
DE_GEOGLST_NAM		VARCHAR2(25)
DE_BEG_DTE	NOT NULL	DATE
EP_ID	NOT NULL	VARCHAR2(10)
ENV_PROJ_TASK_CODE	NOT NULL	VARCHAR2(5)
ML_ID	NOT NULL	VARCHAR2(10)
ME_BEG_DTE	NOT NULL	DATE
ME_SEQ_NO	NOT NULL	NUMBER(8)

SQL> DESC AXT.DRILLING_METHOD

Name	Null?	Type
DRILL_METH_DESC	NOT NULL	VARCHAR2(80)
DRILL_METH_CODE	NOT NULL	VARCHAR2(2)

SQL> DESC AXT.ENV_MON_LOC_FLOW

Name	Null?	Type
EMLF_MIN_RATE		NUMBER
EMLF_MAX_RATE		NUMBER
EMLF_TIME	NOT NULL	NUMBER(4)
EMLF_RATE	NOT NULL	NUMBER
EMLF_DTE	NOT NULL	DATE
EMLF_CONV_MIN_RATE		NUMBER
EMLF_CONV_MAX_RATE		NUMBER
EMLF_METH_CODE	NOT NULL	VARCHAR2(10)
EMLF_CONV_RATE	NOT NULL	NUMBER
EMLF_UNT_ABBR	NOT NULL	VARCHAR2(8)
EMLF_CONV_UNT_ABBR	NOT NULL	VARCHAR2(8)
ML_ID	NOT NULL	VARCHAR2(10)

SQL> DESC AXT.ENV_PROJECT

Name	Null?	Type
EP_COMMENT		VARCHAR2(200)
EP_SPON	NOT NULL	VARCHAR2(50)
EP_OU_ACRONYM		VARCHAR2(10)
EP_ADS_NO		VARCHAR2(10)
EP_ADS_NAM		VARCHAR2(60)
EP_RQMT_SRCE_ID		VARCHAR2(8)
EP_NAM	NOT NULL	VARCHAR2(100)
EP_END_DTE		DATE
EP_BEG_DTE	NOT NULL	DATE
EP_ID	NOT NULL	VARCHAR2(10)
EP_DESC		VARCHAR2(200)

SQL> DESC AXT.ENV_PROJECT_TASK

Name	Null?	Type
ENV_PROJ_TASK_DESC	NOT NULL	VARCHAR2(80)
ENV_PROJ_TASK_CODE	NOT NULL	VARCHAR2(5)
EP_ID	NOT NULL	VARCHAR2(10)

SQL> DESC IGI.ENV_PROJ_TASK_LOC

Name	Null?	Type
ML_ID	NOT NULL	VARCHAR2(10)
EP_ID	NOT NULL	VARCHAR2(10)
ENV_PROJ_TASK_CODE	NOT NULL	VARCHAR2(5)

SQL> DESC AXT.EQUP_CALB_EVENT

Name	Null?	Type
EQUP_CALB_COMMENT		VARCHAR2(200)
EQUP_CALB_SEQ_NO	NOT NULL	NUMBER(3)
EQUP_CALB_TYP	NOT NULL	VARCHAR2(10)
EQUP_CALB_TIME	NOT NULL	NUMBER(4)
EQUP_CALB_DTE	NOT NULL	DATE
EQUP_ID	NOT NULL	VARCHAR2(9)
BDGD_PRSN_BADGE_NO	NOT NULL	VARCHAR2(6)

SQL> DESC IGI.EQUP_CALB_EVT_FRM

Name	Null?	Type
FRM_NO	NOT NULL	VARCHAR2(15)
FRM_TYP	NOT NULL	VARCHAR2(10)
EQUP_ID	NOT NULL	VARCHAR2(9)
EQUP_CALB_DTE	NOT NULL	DATE
EQUP_CALB_SEQ_NO	NOT NULL	NUMBER(3)

SQL> DESC AXT.EQUP_CALB_RESULT

Name	Null?	Type
CALB_RSLT_COMMENT		VARCHAR2(200)
EQUP_CALB_FLG	NOT NULL	VARCHAR2(1)
EQUP_CALB_TEMP		NUMBER
EQUP_CALB_PARAM	NOT NULL	VARCHAR2(9)
CALB_RSLT_SEQ_NO	NOT NULL	NUMBER(8)
EQUP_CALB_UNIT	NOT NULL	VARCHAR2(8)
EQUP_CALB_VAL	NOT NULL	NUMBER
EQUP_ID	NOT NULL	VARCHAR2(9)
EQUP_CALB_DTE	NOT NULL	DATE
EQUP_CALB_SEQ_NO	NOT NULL	NUMBER(3)

SQL> DESC IGI.EQUP_INIT_EVT_FRM

Name	Null?	Type
FRM_NO	NOT NULL	VARCHAR2(15)
FRM_TYP	NOT NULL	VARCHAR2(10)
EQUP_ID	NOT NULL	VARCHAR2(9)
ML_ID	NOT NULL	VARCHAR2(10)
EL_INIT_DTE	NOT NULL	DATE

SQL> DESC AXT.EQUP_INSP_EVENT

Name	Null?	Type
EQUP_INSP_COMMENT		VARCHAR2(200)
EQUP_INSP_DTE	NOT NULL	DATE
EQUP_ID	NOT NULL	VARCHAR2(9)
BDGD_PRSN_BADGE_NO	NOT NULL	VARCHAR2(6)

SQL> DESC IGI.EQUP_INSP_EVT_FRM

Name	Null?	Type
FRM_NO	NOT NULL	VARCHAR2(15)
FRM_TYP	NOT NULL	VARCHAR2(10)
EQUP_ID	NOT NULL	VARCHAR2(9)
EQUP_INSP_DTE	NOT NULL	DATE

SQL> DESC AXT.EQUP_LOC_INIT_EVT

Name	Null?	Type
EL_INIT_COMMENT		VARCHAR2(200)
EL_INIT_TIME	NOT NULL	NUMBER(4)
EL_INIT_DTE	NOT NULL	DATE
EQUP_ID	NOT NULL	VARCHAR2(9)
ML_ID	NOT NULL	VARCHAR2(10)
BDGD_PRSN_BADGE_NO	NOT NULL	VARCHAR2(6)

SQL> DESC AXT.EQUP_LOC_REM_EVENT

Name	Null?	Type
EL_REM_TIME	NOT NULL	NUMBER(4)
EL_REM_COMMENT		VARCHAR2(200)
EL_REM_DTE	NOT NULL	DATE
EQUP_ID	NOT NULL	VARCHAR2(9)
ML_ID	NOT NULL	VARCHAR2(10)
EL_INIT_DTE	NOT NULL	DATE
BDGD_PRSN_BADGE_NO	NOT NULL	VARCHAR2(6)

SQL> DESC IGI.EQUP_REM_EVT_FRM

Name	Null?	Type
FRM_NO	NOT NULL	VARCHAR2(15)
FRM_TYP	NOT NULL	VARCHAR2(10)
EL_INIT_DTE	NOT NULL	DATE
ML_ID	NOT NULL	VARCHAR2(10)
EQUP_ID	NOT NULL	VARCHAR2(9)
EL_REM_DTE	NOT NULL	DATE

SQL> DESC IGI.EQUP_REPAIR_EVENT

Name	Null?	Type
EQUP_REPR_EVT_DTE	NOT NULL	DATE
EQUP_REPR_RET_DTE		DATE
EQUP_REPR_COMMENT		VARCHAR2(200)
EQUP_REPR_SND_DTE		DATE
EQUP_ID	NOT NULL	VARCHAR2(9)
FRM_NO	NOT NULL	VARCHAR2(15)
FRM_TYP	NOT NULL	VARCHAR2(10)
BDGD_PRSN_BADGE_NO	NOT NULL	VARCHAR2(6)

SQL> DESC AXT.EXCEPTION_EVENT

Name	Null?	Type
EXCEPT_EVT_DESC		VARCHAR2(200)
EXCEPT_EVT_YEAR	NOT NULL	VARCHAR2(4)
EXCEPT_EVT_NO	NOT NULL	NUMBER(8)
EXCEPT_EVT_SEV_COD	NOT NULL	VARCHAR2(10)
EXCEPT_EVT_DET_DTE	NOT NULL	DATE
SMPL_ID		VARCHAR2(15)
SMPL_PROCED_REV		VARCHAR2(10)
SMPL_PROCED_NO		VARCHAR2(15)
SAP_ELEMENT_ML_ID		VARCHAR2(9)
MONIT_FREQ_CODE		VARCHAR2(5)
SAP_PARAM_CODE		VARCHAR2(9)
SAP_ELE_ACT_DTE		DATE
FM_PARAM_CODE		VARCHAR2(9)
ME_SEQ_NO		NUMBER(8)
ME_BEG_DTE		DATE
FM_ML_ID		VARCHAR2(10)
ENV_PROJ_TASK_CODE		VARCHAR2(5)
EP_ID		VARCHAR2(10)
FM_SEQ_NO		NUMBER(3)
FM_DTE_COLL		DATE
SMPL_TST_ASSOC_TYP		VARCHAR2(6)
SMPL_TST_ASSOC_ID		VARCHAR2(15)
SMPL_TST_SEQ_NO		NUMBER(8)
REG_METH_ID		VARCHAR2(25)
REG_METH_AGENCY		VARCHAR2(5)
LAB_TST_ID		VARCHAR2(7)
LAB_TST_TYP		VARCHAR2(1)
RSLT_PARAM_CODE		VARCHAR2(9)
SR_ID		VARCHAR2(15)
SR_SEQ_NO		NUMBER(3)

SQL> DESC AXT.EXTERNAL_QC_SAMPLE

Name	Null?	Type
EQCS_EPA_ID		VARCHAR2(12)
EQCS_QTY_UNIT		VARCHAR2(8)
EQCS_QTY_VAL		NUMBER
EQCS_ID	NOT NULL	VARCHAR2(10)
LAB_CODE	NOT NULL	VARCHAR2(6)
SMPL_ID		VARCHAR2(15)
MATRX_TYP_CODE	NOT NULL	VARCHAR2(5)
SPIKE_DUP_LAB_CODE		VARCHAR2(6)
SPIKE_DUP_EQCS_ID		VARCHAR2(10)
QCT_CODE	NOT NULL	VARCHAR2(15)

SQL> DESC AXT.FIELD_EQUIPMENT

Name	Null?	Type
EQUP_RETIRED_DTE		DATE
EQUP_COMMENT		VARCHAR2(200)
EQUP_MFG_NAM	NOT NULL	VARCHAR2(40)
EQUP_BEG_DTE	NOT NULL	DATE
EQUP_MODEL_NO	NOT NULL	VARCHAR2(40)
EQUP_TYP	NOT NULL	VARCHAR2(40)
EQUP_STAT_CODE	NOT NULL	VARCHAR2(1)
EQUP_LAST_CALB_DTE		DATE
EQUP_ID	NOT NULL	VARCHAR2(9)
EQUP_MFG_SER_NO	NOT NULL	VARCHAR2(40)
CO_CODE		VARCHAR2(5)
BDGD_PRSN_BADGE_NO	NOT NULL	VARCHAR2(6)

SQL> DESC AXT.FIELD_MEASUREMENT

Name	Null?	Type
FM_LOG_ID		VARCHAR2(8)
FM_LOG_BEG_PGE_NO		NUMBER(8)
FM_DATA_USE_QUAL		VARCHAR2(4)
FM_RSLT_VALID_QUAL		VARCHAR2(4)
FM_RSLT_QUAL		VARCHAR2(4)
FM_DEPTH_UNIT		VARCHAR2(8)
FM_DEPTH		NUMBER(8,2)
FM_COMMENT		VARCHAR2(200)
FM_DTE_COLL	NOT NULL	DATE
FM_TIME_COLL		NUMBER(4)
FM_RPT_RSLT	NOT NULL	NUMBER
FM_RPT_UNIT	NOT NULL	VARCHAR2(8)
FM_INIT_FNL_INDCTR		VARCHAR2(1)
FM_CONV_RPT_RSLT		NUMBER
FM_CONV_UNIT		VARCHAR2(8)
FM_SEQ_NO	NOT NULL	NUMBER(3)
FM_REVISED_FLG		VARCHAR2(1)
FM_METH	NOT NULL	VARCHAR2(10)
PARAM_CODE	NOT NULL	VARCHAR2(9)
EP_ID	NOT NULL	VARCHAR2(10)
ENV_PROJ_TASK_CODE	NOT NULL	VARCHAR2(5)
ML_ID	NOT NULL	VARCHAR2(10)
ME_BEG_DTE	NOT NULL	DATE
ME_SEQ_NO	NOT NULL	NUMBER(8)
EQUP_ID	NOT NULL	VARCHAR2(9)

SQL> DESC IGI.FIELD_TASK_MAP

Name	Null?	Type
MATRX_TYP_CODE		VARCHAR2(5)
ENV_PROJ_TASK_CODE		VARCHAR2(5)
ME_BEG_DTE		DATE
KIT_ID		VARCHAR2(10)
KIT_PREP_DTE		DATE
ML_ID		VARCHAR2(10)
SMPL_ID		VARCHAR2(15)
SMPLR_TYP_CODE		VARCHAR2(3)
SMPL_PROCED_NO		VARCHAR2(15)
SMPL_PROC_TYP_COD		VARCHAR2(15)
SMPL_CONT_MIN_VOL		NUMBER
SMPL_CONT_UNT_ABBR		VARCHAR2(8)
SMPL_CONT_MATL_COD		VARCHAR2(10)
SMPL_CERT_LOT_NO		VARCHAR2(15)
PRESERVATIVE_CODE		VARCHAR2(10)
SMPL_TYP_CODE		VARCHAR2(10)
CO_Name		VARCHAR2(10)
FCOC_FRM_NO		VARCHAR2(15)
LOGBOOK_FRM_NO		VARCHAR2(15)
PARAM_ANLY_CAT_COD		VARCHAR2(10)
LAB_CODE		VARCHAR2(6)
FCTM_FRM_NO		VARCHAR2(15)
FLD_SEQ		NUMBER(8)
AREA_GRP_ID		VARCHAR2(15)
SPEC_INSTR		VARCHAR2(40)
STATUS_CODE		VARCHAR2(1)
LOAD_FLAG		VARCHAR2(1)

SQL> DESC IGI.FLD_COLL_REF

Name	Null?	Type
ENV_PROJ_TASK_CODE		VARCHAR2(5)
MATRX_TYP_CODE		VARCHAR2(5)
ML_ID		VARCHAR2(10)
SMPLR_TYP_CODE		VARCHAR2(3)
SMPL_PROCED_NO		VARCHAR2(15)
SMPL_PROC_TYP_COD		VARCHAR2(15)
SMPL_CONT_MIN_VOL		NUMBER
SMPL_CONT_UNT_ABBR		VARCHAR2(8)
SMPL_CONT_MATL_COD		VARCHAR2(10)
PRESERVATIVE_CODE		VARCHAR2(10)
PARAM_ANLY_CAT_COD		VARCHAR2(10)
SMPL_TYP_CODE		VARCHAR2(10)
CO_Name		VARCHAR2(10)
LAB_CODE		VARCHAR2(6)
AREA_GRP_ID		VARCHAR2(10)
SPEC_INSTR		VARCHAR2(40)
FLD_SEQ		NUMBER(8)

SQL> DESC AXT.GEOLOGIC_FORMATION

Name	Null?	Type
GEO_FORM_CODE	NOT NULL	VARCHAR2(6)
GEO_FORM_NAM	NOT NULL	VARCHAR2(30)
GEO_GRP_CODE		VARCHAR2(6)

SQL> DESC AXT.GEOLOGIC_GROUP

Name	Null?	Type
GEO_GRP_NAM	NOT NULL	VARCHAR2(12)
GEO_GRP_CODE	NOT NULL	VARCHAR2(6)

SQL> DESC AXT.GPS_LOCATION

Name	Null?	Type
GPSL_ID	NOT NULL	VARCHAR2(24)
GPSL_ELLPS_STD_ERR		NUMBER(4,3)
GPSL_LONG_STD_ERR		NUMBER(4,3)
GPSL_LAT_STD_ERR		NUMBER(4,3)
GPSL_ELLPS_HGHT		NUMBER(6,3)
GPSL_LONGITUDE		VARCHAR2(12)
GPSL_LATITUDE		VARCHAR2(12)
EP_ID		VARCHAR2(10)
ENV_PROJ_TASK_CODE		VARCHAR2(5)
ME_ML_ID		VARCHAR2(10)
ME_BEG_DTE		DATE
ME_SEQ_NO		NUMBER(8)
ML_ID		VARCHAR2(10)

SQL> DESC AXT.HOLE_INTERVAL

Name	Null?	Type
HI_ACT_SOIL_RECV		NUMBER(8,2)
HI_PLAN_SOIL_RECV		NUMBER(8,2)
HI_ASTM_CODE		VARCHAR2(4)
HI_DIAM_UNIT	NOT NULL	VARCHAR2(8)
HI_DIAM	NOT NULL	NUMBER(8,3)
HI_COMMENT		VARCHAR2(200)
HI_END_DPTH	NOT NULL	NUMBER(8,2)
HI_BEG_DPTH	NOT NULL	NUMBER(8,2)
HI_VSUAL_DESC		VARCHAR2(200)
ME_SEQ_NO	NOT NULL	NUMBER(8)
ME_BEG_DTE	NOT NULL	DATE
ML_ID	NOT NULL	VARCHAR2(10)
ENV_PROJ_TASK_CODE	NOT NULL	VARCHAR2(5)
EP_ID	NOT NULL	VARCHAR2(10)
DRILL_METH_CODE	NOT NULL	VARCHAR2(2)

SQL> DESC IGI.HOLE_INTERVAL_CHAR

Name	Null?	Type
EP_ID	NOT NULL	VARCHAR2(10)
ENV_PROJ_TASK_CODE	NOT NULL	VARCHAR2(5)
ML_ID	NOT NULL	VARCHAR2(10)
ME_BEG_DTE	NOT NULL	DATE
ME_SEQ_NO	NOT NULL	NUMBER(8)
HI_BEG_DPTH	NOT NULL	NUMBER(8,2)
INTV_CHAR_TYP_CODE	NOT NULL	VARCHAR2(10)

SQL> DESC AXT.INTERVAL_CHAR_TYPE

Name	Null?	Type
INTV_CHAR_TYP_DESC	NOT NULL	VARCHAR2(80)
INTV_CHAR_TYP_NAM	NOT NULL	VARCHAR2(50)
INTV_CHAR_TYP_CODE	NOT NULL	VARCHAR2(10)

SQL> DESC AXT.INT_QC_SAMPLE

Name	Null?	Type
QC_SMPL_ORIG_CODE	NOT NULL	VARCHAR2(10)
SMPL_ID	NOT NULL	VARCHAR2(15)
QCT_CODE		VARCHAR2(15)
QC_MATL_ID		VARCHAR2(20)

SQL> DESC IGI.INT_QC_SMPL_RQMT

Name	Null?	Type
SMPL_RQMT_ID	NOT NULL	VARCHAR2(10)
SMPL_ID	NOT NULL	VARCHAR2(15)

SQL> DESC AXT.KIT

Name	Null?	Type
KIT_PREP_DTE	NOT NULL	DATE
KIT_ID	NOT NULL	VARCHAR2(10)

SQL> DESC AXT.LAB

Name	Null?	Type
LAB_ZIP_CODE		NUMBER(9)
LAB_STATE		VARCHAR2(2)
LAB_CITY		VARCHAR2(20)
LAB_STREET		VARCHAR2(40)
LAB_NAM	NOT NULL	VARCHAR2(50)
LAB_CODE	NOT NULL	VARCHAR2(6)

SQL> DESC IGI.LAB_COC

Name	Null?	Type
FRM_NO	NOT NULL	VARCHAR2(15)
FRM_TYP	NOT NULL	VARCHAR2(10)
SDG_NO	NOT NULL	VARCHAR2(9)

SQL> DESC AXT.LAB_CONTACT

Name	Null?	Type
LAB_CONT_PHONE	NOT NULL	NUMBER(10)
LAB_CONT_NAM	NOT NULL	VARCHAR2(30)
LAB_CODE	NOT NULL	VARCHAR2(6)
EP_ID	NOT NULL	VARCHAR2(10)
ENV_PROJ_TASK_CODE	NOT NULL	VARCHAR2(5)

SQL> DESC AXT.LAB_INSTRUMENT

Name	Null?	Type
LAB_INST_TYP	NOT NULL	VARCHAR2(12)
LAB_INST_ID	NOT NULL	VARCHAR2(10)
LAB_CODE	NOT NULL	VARCHAR2(6)

SQL> DESC AXT.LAB_INST_CALB_EVT

Name	Null?	Type
LAB_INST_LAST_TIME	NOT NULL	NUMBER(4)
LAB_INST_LAST_DTE	NOT NULL	DATE
LAB_INST_CALB_CAT	NOT NULL	VARCHAR2(25)
LAB_INST_CONC_LVL		NUMBER
LAB_INST_GC_COL		VARCHAR2(10)
LAB_INST_GC_COL_ID		VARCHAR2(10)
LAB_INST_CALB_FILE	NOT NULL	VARCHAR2(14)
LAB_INST_CALB_TYP	NOT NULL	VARCHAR2(10)
LAB_INST_CALB_TIME	NOT NULL	NUMBER(4)
LAB_INST_CALB_DTE	NOT NULL	DATE
LAB_CODE	NOT NULL	VARCHAR2(6)
LAB_INST_ID	NOT NULL	VARCHAR2(10)
REG_METH_ID	NOT NULL	VARCHAR2(25)
REG_METH_AGENCY	NOT NULL	VARCHAR2(5)
LAB_TST_ID	NOT NULL	VARCHAR2(7)
LAB_TST_TYP	NOT NULL	VARCHAR2(1)

SQL> DESC AXT.LAB_INST_CALB_RSLT

Name	Null?	Type
INST_CALB_RSLT_SEQ	NOT NULL	NUMBER(2)
INST_CALB_COMMENT		VARCHAR2(200)
INST_CALB_RSLT_TYP	NOT NULL	VARCHAR2(9)
INST_CALB_RSLT_UNT	NOT NULL	VARCHAR2(8)
INST_CALB_RSLT_VAL	NOT NULL	NUMBER
LAB_INST_ID	NOT NULL	VARCHAR2(10)
LAB_CODE	NOT NULL	VARCHAR2(6)
LAB_TST_TYP	NOT NULL	VARCHAR2(1)
LAB_TST_ID	NOT NULL	VARCHAR2(7)
REG_METH_AGENCY	NOT NULL	VARCHAR2(5)
REG_METH_ID	NOT NULL	VARCHAR2(25)
LAB_INST_CALB_TIME	NOT NULL	NUMBER(4)
LAB_INST_CALB_DTE	NOT NULL	DATE
PARAM_CODE	NOT NULL	VARCHAR2(9)

SQL> DESC IGI.LAB_PROC_MAP

Name	Null?	Type
FLD_SEQ	NOT NULL	NUMBER(8)
SMPL_ID		VARCHAR2(15)
MATRX_TYP_CODE	NOT NULL	VARCHAR2(5)
ENV_PROJ_TASK_CODE	NOT NULL	VARCHAR2(5)
ME_BEG_DTE		DATE
SMPL_PROC_TYP_CODE		VARCHAR2(15)
SMPL_BEG_INTV		NUMBER
SMPL_END_INTV		NUMBER
SMPL_DTE		DATE
SMPL_PROCED_NO		VARCHAR2(15)
SMPL_CONT_MIN_VOL		NUMBER
SMPL_CONT_UNT_ABBR		VARCHAR2(8)
SMPL_CONT_MATL_COD		VARCHAR2(10)
SMPL_CERT_LOT_NO		VARCHAR2(15)
PRESERVATIVE_CODE		VARCHAR2(10)
SMPL_TYP_CODE		VARCHAR2(10)
LAB_MATRX_TYP_COD		VARCHAR2(5)
LAB_CODE		VARCHAR2(6)
PARAM_ANLY_GRP_COD		VARCHAR2(10)
LPTM_FRM_NO		VARCHAR2(15)
SPEC_INSTR		VARCHAR2(40)
LOAD_FLAG		VARCHAR(1)
LAB_SMPL_ID		VARCHAR2(15)
SEQ		NUMBER(4)

SQL> DESC IGI.LAB_PROC_REF

Name	Null?	Type
FLD_SEQ	NOT NULL	NUMBER(8)
MATRX_TYP_CODE		VARCHAR2(5)
SMPL_PROC_TYP_CODE		VARCHAR2(15)
SMPL_PROCED_NO		VARCHAR2(15)
SMPL_CONT_MIN_VOL		NUMBER
SMPL_CONT_UNT_ABBR		VARCHAR2(8)
SMPL_CONT_MATL_COD		VARCHAR2(10)
PRESERVATIVE_CODE		VARCHAR2(10)
LAB_CODE		VARCHAR2(6)
PARAM_ANLY_GRP_COD		VARCHAR2(10)
SMPL_BEG_INTV		NUMBER
SMPL_END_INTV		NUMBER
SPEC_INSTR		VARCHAR2(40)
NEW_SMPL_FLAG		CHAR(1)
SMPL_INTV_UNIT		VARCHAR2(8)

SQL> DESC AXT.LAB_TEST

Name	Null?	Type
LAB_TST_ID	NOT NULL	VARCHAR2(7)
LAB_TST_NAM	NOT NULL	VARCHAR2(50)
LAB_TST_TYP	NOT NULL	VARCHAR2(1)
LAB_TST_HLD_FLG	NOT NULL	VARCHAR2(1)
LAB_TST_HLD_QTY		NUMBER
LAB_TST_HLD_UNIT		VARCHAR2(8)
REG_METH_AGENCY	NOT NULL	VARCHAR2(5)
REG_METH_ID	NOT NULL	VARCHAR2(25)

SQL> DESC AXT.LAB_TEST_MATRIX

Name	Null?	Type
LAB_MATRX_HLD_QTY	NUMBER	
LAB_MATRX_HLD_UNIT		VARCHAR2(8)
LAB_MATRX_MIN_UNIT	NOT NULL	VARCHAR2(2)
LAB_MATRX_MIN_REQD	NOT NULL	NUMBER
LAB_MATRX_DEF_UNIT		VARCHAR2(8)
REG_METH_ID	NOT NULL	VARCHAR2(25)
REG_METH_AGENCY	NOT NULL	VARCHAR2(5)
LAB_TST_ID	NOT NULL	VARCHAR2(7)
LAB_TST_TYP	NOT NULL	VARCHAR2(1)
MATRX_TYP_CODE	NOT NULL	VARCHAR2(5)

SQL> DESC AXT.LAB_TEST_PARAMETER

Name	Null?	Type
LTP_EPA_METH		VARCHAR2(25)
LTP_SURRGT_FLG	NOT NULL	VARCHAR2(1)
LTP_HLD_UNIT		VARCHAR2(8)
LTP_HLD_QTY		NUMBER
REG_METH_ID	NOT NULL	VARCHAR2(25)
REG_METH_AGENCY	NOT NULL	VARCHAR2(5)
LAB_TST_ID	NOT NULL	VARCHAR2(7)
LAB_TST_TYP	NOT NULL	VARCHAR2(1)
PARAM_CODE	NOT NULL	VARCHAR2(9)

SQL> DESC AXT.LAB_TEST_PARAM_LIM

Name	Null?	Type
LAB_TST_DET_LIM		NUMBER
LAB_TST_LOW_LIM		NUMBER
MATRX_TYP_CODE	NOT NULL	VARCHAR2(5)
LAB_TST_TYP	NOT NULL	VARCHAR2(1)
LAB_TST_ID	NOT NULL	VARCHAR2(7)
REG_METH_AGENCY	NOT NULL	VARCHAR2(5)
REG_METH_ID	NOT NULL	VARCHAR2(25)
PARAM_CODE	NOT NULL	VARCHAR2(9)

SQL> DESC AXT.LAB_TEST_QUAL

Name	Null?	Type
LAB_TST_QUAL_CODE	NOT NULL	VARCHAR2(2)
LAB_TST_QUAL_DESC	NOT NULL	VARCHAR2(20)

SQL> DESC AXT.MATRIX_TYPE

Name	Null?	Type
MATRX_TYP_USE_CODE	NOT NULL	VARCHAR2(1)
MATRX_TYP_DESC	NOT NULL	VARCHAR2(80)
MATRX_TYP_CODE	NOT NULL	VARCHAR2(5)

SQL> DESC AXT.MEASUREMENT_UNIT

Name	Null?	Type
MEAS_UNIT_ABBR	NOT NULL	VARCHAR2(8)
MEAS_UNIT_NAM	NOT NULL	VARCHAR2(30)

SQL> DESC AXT.MEAS_UNIT_CONV_FAC

Name	Null?	Type
MUCF_PREF_UNT_ABBR	NOT NULL	VARCHAR2(8)
MUCF_RPT_UNIT_ABBR	NOT NULL	VARCHAR2(8)
MUCF_RSLT_VAL	NOT NULL	NUMBER
MUCF_RSLT_VAL_EXP	NOT NULL	NUMBER
PRF_MEAS_UNIT_ABBR	NOT NULL	VARCHAR2(8)
RPT_MEAS_UNIT_ABBR	NOT NULL	VARCHAR2(8)

SQL> DESC IGI.ME_DATA_XFER_FILE

Name	Null?	Type
DATA_XFER_FILE_NAM	NOT NULL	VARCHAR2(20)
EP_ID	NOT NULL	VARCHAR2(10)
ENV_PROJ_TASK_CODE	NOT NULL	VARCHAR2(5)
ML_ID	NOT NULL	VARCHAR2(10)
ME_BEG_DTE	NOT NULL	DATE
ME_SEQ_NO	NOT NULL	NUMBER(8)

SQL> DESC AXT.MONITORING_EVENT

Name	Null?	Type
ME_END_TIME		NUMBER(4)
ME_END_DTE		DATE
ME_COMMENT		VARCHAR2(200)
ME_SEQ_NO	NOT NULL	NUMBER(8)
ME_WEATHER		VARCHAR2(50)
ME_BEG_TIME	NUMBER(4)	
ME_BEG_DTE	NOT NULL	DATE
ML_ID	NOT NULL	VARCHAR2(10)
ENV_PROJ_TASK_CODE	NOT NULL	VARCHAR2(5)
EP_ID	NOT NULL	VARCHAR2(10)
MONIT_TEAM_ID	NUMBER(5)	

SQL> DESC AXT.MONITORING_TEAM

Name	Null?	Type
MONIT_TEAM_ID	NOT NULL	NUMBER(5)

SQL> DESC IGI.MONIT_EVT_DATA_FRM

Name	Null?	Type
FRM_NO	NOT NULL	VARCHAR2(15)
FRM_TYP	NOT NULL	VARCHAR2(10)
EP_ID	NOT NULL	VARCHAR2(10)
ENV_PROJ_TASK_CODE	NOT NULL	VARCHAR2(5)
ML_ID	NOT NULL	VARCHAR2(10)
ME_BEG_DTE	NOT NULL	DATE
ME_SEQ_NO	NOT NULL	NUMBER(8)

SQL> DESC AXT.MONIT_FREQUENCY

Name	Null?	Type
MONIT_FREQ_CODE	NOT NULL	VARCHAR2(5)
MONIT_FREQ_DESC	NOT NULL	VARCHAR2(80)

SQL> DESC AXT.MONIT_LOCATION

Name	Null?	Type
ML_GPS_VAR_CODE	NOT NULL	VARCHAR2(1)
ML_MARKER_UNIT		VARCHAR2(8)
ML_MARKER_NO		VARCHAR2(10)
ML_NAM		VARCHAR2(9)
ML_STAT_CODE		VARCHAR2(2)
ML_MEAS_ERR		NUMBER
ML_MEAS_METH		VARCHAR2(10)
ML_ELEV_MEAS_METH		VARCHAR2(10)
ML_ELEV_MEAS_ERR		NUMBER
ML_NORTHING		NUMBER
ML_EASTING		NUMBER
ML_GND_ELEV		NUMBER
ML_COMMENT		VARCHAR2(200)
ML_GRID_SYS		VARCHAR2(10)
ML_DESC		VARCHAR2(200)
ML_TYP		VARCHAR2(2)
ML_ID	NOT NULL	VARCHAR2(10)
RIVER_ID		VARCHAR2(2)

SQL> DESC AXT.MONIT_LOC_ALIAS

Name	Null?	Type
MLA_BEG_DTE		DATE
MLA_NAM	NOT NULL	VARCHAR2(9)
MLA_ID	NOT NULL	VARCHAR2(10)
ML_ID	NOT NULL	VARCHAR2(10)

SQL> DESC AXT.MONIT_LOC_SRVC_PER

Name	Null?	Type
MLSP_COMMENT		VARCHAR2(200)
MLSP_END_DTE		DATE
MLSP_BEG_DTE	NOT NULL	DATE
ML_ID	NOT NULL	VARCHAR2(10)

SQL> DESC AXT.PARAMETER

Name	Null?	Type
PARAM_CODE	NOT NULL	VARCHAR2(9)
PARAM_ABBR		VARCHAR2(5)
PARAM_CAS_ID		VARCHAR2(12)
PARAM_STD_NAM	NOT NULL	VARCHAR2(50)

SQL> DESC AXT.PARAM_ANALYSIS_CAT

Name	Null?	Type
PARAM_ANLY_CAT_NAM	NOT NULL	VARCHAR2(80)
PARAM_ANLY_CAT_COD	NOT NULL	VARCHAR2(10)

SQL> DESC AXT.PARAM_ANALYSIS_GRP

Name	Null?	Type
PARAM_ANLY_GRP_NAM	NOT NULL	VARCHAR2(80)
PARAM_ANLY_GRP_COD	NOT NULL	VARCHAR2(10)

SQL> DESC IGI.PARM_TAB

Name	Null?	Type
MATRX_TYP_CODE		VARCHAR2(5)
ENV_PROJ_TASK_CODE		VARCHAR2(5)
ME_BEG_DTE		DATE
KIT_ID		VARCHAR2(10)
KIT_PREP_DTE		DATE
FCOC_FRM_NO		VARCHAR2(15)
LOGBOOK_FRM_NO		VARCHAR2(15)
AREA_GRP_ID		VARCHAR2(15)
ML_ID		VARCHAR2(10)
SMPL_TYPE_1		VARCHAR2(10)
SMPL_TYPE_2		VARCHAR2(10)
SMPL_TYPE_3		VARCHAR2(10)
SMPL_TYPE_4		VARCHAR2(10)
SMPL_TYPE_5		VARCHAR2(10)
SMPL_TYPE_6		VARCHAR2(10)
USER_ID		VARCHAR2(8)

SQL> DESC AXT.PLUGGING_EVENT

Name	Null?	Type
PLUG_EVT_LOC_ID	NOT NULL	VARCHAR2(10)
PLUG_EVT_DTE	NOT NULL	DATE
ML_ID		VARCHAR2(10)

SQL> DESC AXT.PLUGGING_METHOD

Name	Null?	Type
PLUG_METH_NAM	NOT NULL	VARCHAR2(10)
PLUG_METH_DESC	NOT NULL	VARCHAR2(80)

SQL> DESC AXT.PLUG_INTV_MATERIAL

Name	Null?	Type
PLUG_INTV_END_DPTH	NOT NULL	NUMBER(8,2)
PLUG_INTV_BEG_DPTH	NOT NULL	NUMBER(8,2)
PLUG_EVT_DTE	NOT NULL	DATE
PLUG_EVT_LOC_ID	NOT NULL	VARCHAR2(10)
PLUG_MATL_CODE	NOT NULL	VARCHAR2(4)
PLUG_METH_NAM	NOT NULL	VARCHAR2(10)

SQL> DESC AXT.PLUG_MATERIAL

Name	Null?	Type
PLUG_MATL_NAM	NOT NULL	VARCHAR2(30)
PLUG_MATL_CODE	NOT NULL	VARCHAR2(4)

SQL> DESC AXT.PRESERVATIVE

Name	Null?	Type
PRESERVATIVE_NAM	NOT NULL	VARCHAR2(50)
PRESERVATIVE_CODE	NOT NULL	VARCHAR2(10)

SQL> DESC IGI.PT_ANLY_CAT_MATRIX

Name	Null?	Type
PARAM_ANLY_CAT_COD	NOT NULL	VARCHAR2(10)
EP_ID	NOT NULL	VARCHAR2(10)
ENV_PROJ_TASK_CODE	NOT NULL	VARCHAR2(5)
PARAM_ANLY_GRP_COD		VARCHAR2(10)
PARAM_CODE		VARCHAR2(9)

SQL> DESC AXT.PURGE_EVENT

Name	Null?	Type
PURG_EVT_WTR_DISP		VAR.CHAR2(10)
PURG_EVT_SEQ_NO	NOT NULL	NUMBER(8)
PURG_EVT_VOL_UNIT	NOT NULL	VARCHAR2(8)
PURG_EVT_PURG_VOL	NOT NULL	NUMBER
PURG_EVT_TIME	NOT NULL	NUMBER(4)
EP_ID	NOT NULL	VARCHAR2(10)
ENV_PROJ_TASK_CODE	NOT NULL	VARCHAR2(5)
ML_ID	NOT NULL	VARCHAR2(10)
ME_BEG_DTE	NOT NULL	DATE
ME_SEQ_NO	NOT NULL	NUMBER(8)
PURG_METH_CODE	NOT NULL	VARCHAR2(2)

SQL> DESC AXT.PURGE_METHOD

Name	Null?	Type
PURG_METH_DESC	NOT NULL	VARCHAR2(80)
PURG_METH_CODE	NOT NULL	VARCHAR2(2)

SQL> DESC AXT.QC_ANALYTE

Name	Null?	Type
QCA_LOW_QUAL_LIM	NUMBER	
QCA_UP_QUAL_LIM	NUMBER	
QCA_CONC_UNIT	NOT NULL	VARCHAR2(8)
QCA_CONC_VAL	NOT NULL	NUMBER
QC_MATL_ID	NOT NULL	VARCHAR2(20)
PARAM_CODE	NOT NULL	VARCHAR2(9)

SQL> DESC AXT.QC_MATERIAL

Name	Null?	Type
QC_MATL_DESC		VARCHAR2(80)
QC_MATL_ID	NOT NULL	VARCHAR2(20)

SQL> DESC AXT.QC_RESULT

Name	Null?	Type
QC_RSLT_UNIT	NOT NULL	VARCHAR2(10)
QC_RSLT_VAL		NUMBER
QC_RSLT_DESC		VARCHAR2(10)
QCT_CODE	NOT NULL	VARCHAR2(15)
QCTC_NAM	NOT NULL	VARCHAR2(10)
SMPL_TST_ASSOC_TYP	NOT NULL	VARCHAR2(6)
SMPL_TST_ASSOC_ID	NOT NULL	VARCHAR2(15)
SMPL_TST_SEQ_NO	NOT NULL	NUMBER(8)
REG_METH_ID	NOT NULL	VARCHAR2(25)
REG_METH_AGENCY	NOT NULL	VARCHAR2(5)
LAB_TST_ID	NOT NULL	VARCHAR2(7)
LAB_TST_TYP	NOT NULL	VARCHAR2(1)
PARAM_CODE	NOT NULL	VARCHAR2(9)
SR_ID	NOT NULL	VARCHAR2(15)
SR_SEQ_NO	NOT NULL	NUMBER(3)

SQL> DESC AXT.QC_SMPL_REF_MATL

Name	Null?	Type
QCS_FNL_QTY_UNIT	NOT NULL	VARCHAR2(8)
QCS_FNL_QTY		NUMBER
QCS_ADD_QTY_UNIT		VARCHAR2(8)
QCS_ADD_QTY_VAL		NUMBER
REF_MATL_NO	NOT NULL	VARCHAR2(10)
LAB_CODE	NOT NULL	VARCHAR2(6)
EQCS_ID	NOT NULL	VARCHAR2(10)

SQL> DESC AXT.QC_TYPE

Name	Null?	Type
QCT_INI_EXT_CODE	NOT NULL	VARCHAR2(1)
QCT_NAM	NOT NULL	VARCHAR2(50)
QCT_CODE	NOT NULL	VARCHAR2(15)

SQL> DESC AXT.QC_TYPE_COMPONENT

Name	Null?	Type
QCTC_SIG_DIGIT_QTY	NOT NULL	NUMBER(8)
QCTC_DEF_UNIT	NOT NULL	VARCHAR2(8)
QCTC_VAL_FORMAT	NOT NULL	VARCHAR2(20)
QCTC_VAL_LEN	NOT NULL	NUMBER
QCTC_VAL_TYP	NOT NULL	VARCHAR2(10)
QCTC_NAM	NOT NULL	VARCHAR2(10)
QCT_CODE	NOT NULL	VARCHAR2(15)

SQL> DESC AXT.REFERENCE_MATERIAL

Name	Null?	Type
REF_MATL_DESC		VARCHAR2(40)
REF_MATL_NO	NOT NULL	VARCHAR2(10)
REG_METH_ID		VARCHAR2(25)
REG_METH_AGENCY		VARCHAR2(5)
LAB_TST_ID		VARCHAR2(7)
LAB_TST_TYP		VARCHAR2(1)
QCT_CODE		VARCHAR2(15)

SQL> DESC AXT.REF_MATL_ANALYTE

Name	Null?	Type
RMA_CONC_UNIT	NOT NULL	VARCHAR2(8)
RMA_CONC_VAL	NOT NULL	NUMBER(8)
KNOWN_REF_MATL_NO	NOT NULL	VARCHAR2(10)
PARAM_CODE	NOT NULL	VARCHAR2(9)
CONC_REF_MATL_NO		VARCHAR2(10)

SQL> DESC AXT.REGULATORY_METHOD

Name	Null?	Type
REG_METH_AGENCY	NOT NULL	VARCHAR2(5)
REG_METH_ID	NOT NULL	VARCHAR2(25)
REG_METH_DESC	NOT NULL	VARCHAR2(80)
REG_METH_NAM	NOT NULL	VARCHAR2(30)

SQL> DESC AXT.RIVER

Name	Null?	Type
RIVER_NAM	NOT NULL	VARCHAR2(35)
RIVER_ID	NOT NULL	VARCHAR2(2)

SQL> DESC IGI.RPT_FORMAT

Name	Null?	Type
ENV_PROJ_TASK_CODE		VARCHAR2(5)
FTM_RPT_Name		VARCHAR2(15)
LPM_RPT_Name		VARCHAR2(15)

SQL> DESC IGI.SAMPLE

Name	Null?	Type
SMPL_GEN_HIST_ID		VARCHAR2(15)
SMPL_HIST_ID		VARCHAR2(15)
SMPL_COMPOSITE_FLG	NOT NULL	VARCHAR2(1)
SMPL_BIOTA_STAT		VARCHAR2(10)
SMPL_SPECIES		VARCHAR2(30)
SMPL_PROC_TYP_CODE		VARCHAR2(15)
SMPL_BANK_CODE		VARCHAR2(1)
SMPL_SEDIMENT_TYP		VARCHAR2(10)
SMPL_STAT_CODE	NOT NULL	VARCHAR2(2)
SMPL_INTV_UNIT		VARCHAR2(8)
SMPL_CERT_LOT_NO	NOT NULL	VARCHAR2(15)
SMPL_COLL_EQUP_SER		VARCHAR2(8)
SMPL_DTE		DATE
SMPL_TIME		NUMBER(4)
SMPL_FLD_LOG_BG_PG		NUMBER(8)
SMPL_END_INTV		NUMBER
SMPL_BEG_INTV		NUMBER
SMPL_ID	NOT NULL	VARCHAR2(15)
SMPL_COMPL_CHK_FLG	NOT NULL	VARCHAR2(1)
SMPL_COMMENT		VARCHAR2(200)
PARAM_ANLY_CAT_COD		VARCHAR2(10)
KIT_ID		VARCHAR2(10)
SMPL_TYP_CODE		VARCHAR2(10)
SMPLR_TYP_CODE		VARCHAR2(3)
PRESERVATIVE_CODE		VARCHAR2(10)
SMPL_CONT_MATL_COD	NOT NULL	VARCHAR2(10)
SMPL_CONT_UNT_ABBR	NOT NULL	VARCHAR2(8)
SMPL_CONT_MIN_VOL	NOT NULL	NUMBER
EP_ID		VARCHAR2(10)
ENV_PROJ_TASK_CODE		VARCHAR2(5)
ML_ID		VARCHAR2(10)
ME_BEG_DTE		DATE
ME_SEQ_NO		NUMBER(8)
SMPL_PROCED_NO	NOT NULL	VARCHAR2(15)
SMPL_PROCED_REV	NOT NULL	VARCHAR2(10)
SMPL_COMPOS_TO_ID		VARCHAR2(15)
SMPL_SPLIT_FROM_ID		VARCHAR2(15)
MATRX_TYP_CODE		VARCHAR2(5)
SMPL_PAIR_TYP_CODE		VARCHAR2(3)
PARAM_ANLY_GRP_COD		VARCHAR2(10)

SQL> DESC AXT.SAMPLER_TYPE

Name	Null?	Type
SMPLR_TYP_DESC	NOT NULL	VARCHAR2(80)
SMPLR_TYP_CODE	NOT NULL	VARCHAR2(3)

SQL> DESC AXT.SAMPLE_LAB

Name	Null?	Type
SMPL_LAB_ID		VARCHAR2(15)
SMPL_LAB_BATCH_ID		VARCHAR2(10)
SMPL_ID	NOT NULL	VARCHAR2(15)
LAB_CODE	NOT NULL	VARCHAR2(6)
SDG_NO	NOT NULL	VARCHAR2(9)

SQL> DESC AXT.SAMPLE_PAIR_TYPE

Name	Null?	Type
SMPL_PAIR_TYP_NAM	NOT NULL	VARCHAR2(20)
SMPL_PAIR_TYP_CODE	NOT NULL	VARCHAR2(3)

SQL> DESC IGI.SAMPLE_REF_MATL

Name	Null?	Type
SMPL_ID	NOT NULL	VARCHAR2(15)
REF_MATL_NO	NOT NULL	VARCHAR2(10)

SQL> DESC AXT.SAMPLE_RESULT

Name	Null?	Type
SR_SEQ_NO	NOT NULL	NUMBER(3)
SR_MISD_HLD_TIM_QL		VARCHAR2(1)
SR_OUT_CST_LIM_FLG		VARCHAR2(1)
SR_CNF_LVL_LIM_FLG		VARCHAR2(1)
SR_CONF_LVL		NUMBER
SR_PREFIX_QUAL		VARCHAR2(1)
SR_DATA_USE_QUAL		VARCHAR2(4)
SR_COMMENT		VARCHAR2(200)
SR_TENTV_ID_COMPND		VARCHAR2(1)
SR_REV_COMMENT		VARCHAR2(200)
SR_REV_FLG	NOT NULL	VARCHAR2(1)
SR_DILUTION_FAC		NUMBER
SR_CONV_UNIT		VARCHAR2(8)
SR_CONV_VAL		NUMBER
SR_RPT_UNIT	NOT NULL	VARCHAR2(10)
SR_RPT_VAL	NOT NULL	NUMBER
SR_ID	NOT NULL	VARCHAR2(15)
LAB_TST_TYP	NOT NULL	VARCHAR2(1)
LAB_TST_ID	NOT NULL	VARCHAR2(7)
REG_METH_AGENCY	NOT NULL	VARCHAR2(5)
REG_METH_ID	NOT NULL	VARCHAR2(25)
SMPL_TST_SEQ_NO	NOT NULL	NUMBER(8)
SMPL_TST_ASSOC_ID	NOT NULL	VARCHAR2(15)
SMPL_TST_ASSOC_TYP	NOT NULL	VARCHAR2(6)
PARAM_CODE	NOT NULL	VARCHAR2(9)
DATA_USE_QUAL_CODE		VARCHAR2(4)

SQL> DESC AXT.SAMPLE_TEST

Name	Null?	Type
SMPL_TST_COMMENT		VARCHAR2(200)
SMPL_TST_ASSOC_TYP	NOT NULL	VARCHAR2(6)
SMPL_TST_ASSOC_ID	NOT NULL	VARCHAR2(15)
SMPL_TST_CST		NUMBER(7,2)
SMPL_TST_LAB_FILE		VARCHAR2(14)
SMPL_TST_GC_ID		VARCHAR2(10)
SMPL_TST_GC_COL		VARCHAR2(10)
SMPL_TST_LVL	NOT NULL	VARCHAR2(3)
SMPL_TST_COMPL_TIM		NUMBER(4)
SMPL_TST_COMPL_DTE		DATE
SMPL_TST_BATCH_POS		NUMBER(8)
SMPL_TST_END_QTY		NUMBER
SMPL_TST_QTY_UNIT		VARCHAR2(8)
SMPL_TST_INIT_QTY		NUMBER
SMPL_TST_BATCH_NO	NOT NULL	VARCHAR2(14)
SMPL_TST_TIME	NOT NULL	NUMBER(4)
SMPL_TST_DTE	NOT NULL	DATE
SMPL_TST_SEQ_NO	NOT NULL	NUMBER(8)
REG_METH_ID	NOT NULL	VARCHAR2(25)
REG_METH_AGENCY	NOT NULL	VARCHAR2(5)
LAB_TST_ID	NOT NULL	VARCHAR2(7)
LAB_TST_TYP	NOT NULL	VARCHAR2(1)
SMPL_ID		VARCHAR2(15)
LAB_CODE		VARCHAR2(6)
EXT_QC_LAB_CODE		VARCHAR2(6)
EQCS_ID		VARCHAR2(10)
LAB_INST_LAB_CODE		VARCHAR2(6)
LAB_INST_ID		VARCHAR2(10)

SQL> DESC AXT.SAMPLE_TYPE

Name	Null?	Type
SMPL_TYP_NAM	NOT NULL	VARCHAR2(50)
SMPL_TYP_DESC	NOT NULL	VARCHAR2(80)
SMPL_TYP_CODE	NOT NULL	VARCHAR2(10)

SQL> DESC IGI.SAMPLE_WASTE_CODE

Name	Null?	Type
WASTE_CODE_ID	NOT NULL	VARCHAR2(4)
SMPL_ID	NOT NULL	VARCHAR2(15)

SQL> DESC AXT.SAMPLING_PROCEDURE

Name	Null?	Type
SMPL_PROCED_REV	NOT NULL	VARCHAR2(10)
SMPL_PROCED_DESC	NOT NULL	VARCHAR2(80)
SMPL_PROCED_NO	NOT NULL	VARCHAR2(15)

SQL> DESC AXT.SAP_ELEMENT

Name	Null?	Type
SAP_ELE_ACT_DTE	NOT NULL	DATE
SAP_ELE_INACT_DTE		DATE
SAP_ELE_DTE	NOT NULL	DATE
SAP_ELE_ID	NOT NULL	VARCHAR2(10)
SMPL_PROCED_NO	NOT NULL	VARCHAR2(15)
SMPL_PROCED_REV	NOT NULL	VARCHAR2(10)
ML_ID	NOT NULL	VARCHAR2(10)
MONIT_FREQ_CODE	NOT NULL	VARCHAR2(5)
PARAM_CODE	NOT NULL	VARCHAR2(9)
SAP_ID	NOT NULL	VARCHAR2(10)
MATRX_TYP_CODE	NOT NULL	VARCHAR2(5)

SQL> DESC AXT.SDG_SHIP_CONTNR

Name	Null?	Type
SDG_SHIP_ORD_FRM		VARCHAR2(10)
SDG_TEMP_UNIT		VARCHAR2(1)
SDG_RCPT_COND		VARCHAR2(2)
SDG_RCV_TEMP		NUMBER
SDG_SHIP_TEMP		NUMBER
SDG_CONTNR_TYP		VARCHAR2(1)
SDG_CONTNR_NO	NOT NULL	VARCHAR2(10)
SDG_NO		VARCHAR2(9)

SQL> DESC AXT.SMPL_ANLY_PLAN

Name	Null?	Type
SAP_MONIT_PLAN_ID	NOT NULL	VARCHAR2(10)
SAP_ACT_DTE	NOT NULL	DATE
SAP_ID	NOT NULL	VARCHAR2(10)
EP_ID	NOT NULL	VARCHAR2(10)

SQL> DESC IGI.SMPL_ASSOC_FORM

Name	Null?	Type
SMPL_ID	NOT NULL	VARCHAR2(15)
FRM_NO	NOT NULL	VARCHAR2(15)
FRM_TYP	NOT NULL	VARCHAR2(10)

SQL> DESC IGI.SMPL_ASSOC_INT_QC

Name	Null?	Type
SMPL_ID	NOT NULL	VARCHAR2(15)
INT_QC_SMPL_ID	NOT NULL	VARCHAR2(15)

SQL> DESC AXT.SMPL_CONT_TYPE

Name	Null?	Type
SMPL_CONT_MIN_VOL	NOT NULL	NUMBER
SMPL_CONT_UNT_ABBR	NOT NULL	VARCHAR2(8)
SMPL_CONT_MATL_COD	NOT NULL	VARCHAR2(10)

SQL> DESC AXT.SMPL_DELIVERY_GRP

Name	Null?	Type
SDG_FIN_RPT_DTE		DATE
SDG_RPT_DUE_DTE		DATE
SDG_EPA_CASE_NO		VARCHAR2(10)
SDG_ANLY_REQD_DTE		DATE
SDG_LAB_SHP_DTE		DATE
SDG_LAB_RCD_DTE		DATE
SDG_SHP_CONT_NO		VARCHAR2(10)
SDG_NO	NOT NULL	VARCHAR2(9)

SQL> DESC AXT.SMPL_REQUIREMENT

Name	Null?	Type
SMPL_RQMT_ID	NOT NULL	VARCHAR2(10)
PRESERVATIVE_CODE		VARCHAR2(10)
SMPL_CONT_MATL_COD	NOT NULL	VARCHAR2(10)
SMPL_CONT_UNT_ABBR	NOT NULL	VARCHAR2(8)
SMPL_CONT_MIN_VOL	NOT NULL	NUMBER
SMPL_PROCED_REV		VARCHAR2(10)
SMPL_PROCED_NO		VARCHAR2(15)
ML_ID		VARCHAR2(10)
MONIT_FREQ_CODE		VARCHAR2(5)
PARAM_CODE		VARCHAR2(9)
SAP_ELE_ACT_DTE	NOT NULL	DATE

SQL> DESC IGI.SMPL_RSLT_QUAL

Name	Null?	Type
SMPL_TST_ASSOC_TYP	NOT NULL	VARCHAR2(6)
SMPL_TST_ASSOC_ID	NOT NULL	VARCHAR2(15)
SMPL_TST_SEQ_NO	NOT NULL	NUMBER(8)
REG_METH_ID	NOT NULL	VARCHAR2(25)
REG_METH_AGENCY	NOT NULL	VARCHAR2(5)
LAB_TST_ID	NOT NULL	VARCHAR2(7)
LAB_TST_TYP	NOT NULL	VARCHAR2(1)
PARAM_CODE	NOT NULL	VARCHAR2(9)
SR_ID	NOT NULL	VARCHAR2(15)
SR_SEQ_NO	NOT NULL	NUMBER(3)
VLD_RSLT_QUAL	NOT NULL	VARCHAR2(4)
VLD_RSLT_QUAL_TYP	NOT NULL	VARCHAR2(3)

SQL> DESC AXT.SOW_METHOD

Name	Null?	Type
SOW_METH_ID	NOT NULL	VARCHAR2(25)
ENV_PROJ_TASK_CODE	NOT NULL	VARCHAR2(5)
EP_ID	NOT NULL	VARCHAR2(10)
SOW_NO	NOT NULL	VARCHAR2(18)

SQL> DESC IGI.SOW_METH_PARAM

Name	Null?	Type
SOW_NO	NOT NULL	VARCHAR2(18)
EP_ID	NOT NULL	VARCHAR2(10)
ENV_PROJ_TASK_CODE	NOT NULL	VARCHAR2(5)
SOW_METH_ID	NOT NULL	VARCHAR2(25)
PARAM_CODE	NOT NULL	VARCHAR2(9)
PARAM_ANLY_GRP_COD		VARCHAR2(10)

SQL> DESC AXT.STATEMENT_OF_WORK

Name	Null?	Type
SOW_MAX_SMPL		NUMBER(4)
SOW_FUND_AMT		NUMBER(9,2)
SOW_PURCH_REQ_NO		VARCHAR2(6)
SOW_CHARGE_NO		VARCHAR2(9)
SOW_APO_NO		VARCHAR2(18)
SOW_NO	NOT NULL	VARCHAR2(18)
EP_ID	NOT NULL	VARCHAR2(10)
ENV_PROJ_TASK_CODE	NOT NULL	VARCHAR2(5)
LAB_CODE	NOT NULL	VARCHAR2(6)

SQL> DESC IGI.TEAM_MEMBER_ROLE

Name	Null?	Type
MONIT_TEAM_ID	NOT NULL	NUMBER(5)
TEAM_ROLE_CODE	NOT NULL	VARCHAR2(3)
CO_CODE	NOT NULL	VARCHAR2(5)
BDGD_PRSN_BADGE_NO	NOT NULL	VARCHAR2(6)

SQL> DESC AXT.TEAM_ROLE

Name	Null?	Type
TEAM_ROLE_NAM	NOT NULL	VARCHAR2(50)
TEAM_ROLE_CODE	NOT NULL	VARCHAR2(3)

SQL> DESC AXT.TEST

Name	Null?	Type
EMPNO		NUMBER

SQL> DESC AXT.TEST_PARAM_QC_LIM

Name	Null?	Type
TPQC_CRI_UNIT	NOT NULL	VARCHAR2(8)
TPQC_LOW_LIM_VAL		NUMBER(8)
TPQC_UP_LIM_VAL		NUMBER(8)
LAB_TST_TYP	NOT NULL	VARCHAR2(1)
LAB_TST_ID	NOT NULL	VARCHAR2(7)
REG_METH_AGENCY	NOT NULL	VARCHAR2(5)
REG_METH_ID	NOT NULL	VARCHAR2(25)
PARAM_CODE	NOT NULL	VARCHAR2(9)
QCT_CODE	NOT NULL	VARCHAR2(15)
QCTC_NAM	NOT NULL	VARCHAR2(10)

SQL> DESC AXT.USGS_WEIR_FLOW

Name	Null?	Type
WEIR_STD_FLOW_VAL	NOT NULL	NUMBER
WEIR_FLOW_HGT_VAL	NOT NULL	NUMBER(8,2)
WEIR_FLOW_REC_DTE	NOT NULL	DATE
WEIR_FLOW_REC_TIME	NOT NULL	NUMBER(4)
WEIR_FLOW_VERF_FLG	NOT NULL	VARCHAR2(4)
WEIR_FLOW_BADGE_NO	NOT NULL	VARCHAR2(6)
ML_ID	NOT NULL	VARCHAR2(10)

SQL> DESC IGI.VALID_RSLT_QUAL

Name	Null?	Type
VLD_RSLT_QUAL_TYP	NOT NULL	VARCHAR2(1)
VLD_RSLT_QUAL	NOT NULL	VARCHAR2(4)
VLD_RSLT_QUAL_DESC	NOT NULL	VARCHAR2(80)

SQL> DESC AXT.WASTE_CODE

Name	Null?	Type
WASTE_CODE_ID	NOT NULL	VARCHAR2(4)
WASTE_CODE_DESC	NOT NULL	VARCHAR2(80)

SQL> DESC AXT.WELL

Name	Null?	Type
WELL_USE	NOT NULL	VARCHAR2(1)
WELL_TRNSMSVTY		NUMBER(8,4)
WELL_PERMIT_NO	NOT NULL	VARCHAR2(10)
WELL_ROCK_DPTH		NUMBER(8,2)
WELL_INIT_WTR_DPTH	NOT NULL	NUMBER(8,2)
WELL_TYP	NOT NULL	VARCHAR2(3)
WELL_COMMENT		VARCHAR2(200)
WELL_GROUT		VARCHAR2(4)
WELL_CONSTR_DPTH	NOT NULL	NUMBER(8,2)
WELL_GEO_UNIT		VARCHAR2(8)
WELL_UPRGT_MNT_FLG	NOT NULL	VARCHAR2(1)
WELL_AQUIFIER		VARCHAR2(6)
ML_ID	NOT NULL	VARCHAR2(10)
PLUG_EVT_DTE		DATE
PLUG_EVT_LOC_ID		VARCHAR2(10)
GEO_FORM_CODE	NOT NULL	VARCHAR2(6)

SQL> DESC AXT.WELL_COMPONENT

Name	Null?	Type
WELL_COMP_EVT_ID	NOT NULL	VARCHAR2(32)
WELL_COMP_TOP_DPTH	NOT NULL	NUMBER(8,2)
WELL_COMP_BOT_DPTH	NOT NULL	NUMBER(8,2)
WELL_COMP_INS_DIAM		NUMBER(8,3)
WELL_COMP_OUT_DIAM		NUMBER(8,3)
WELL_COMP_SLOT_SIZ		NUMBER(6,2)
WELL_COMP_MFG_NAM	NOT NULL	VARCHAR2(30)
WELL_COMP_REM_DTE		DATE
COMP_MATL_CODE	NOT NULL	VARCHAR2(4)
COMP_TYP_CODE	NOT NULL	VARCHAR2(4)
WI_ME_SEQ_NO		NUMBER(8)
WI_ME_BEG_DTE		DATE
WI_ML_ID		VARCHAR2(10)
WI_PROJ_TASK_CODE		VARCHAR2(5)
WI_EP_ID		VARCHAR2(10)
WM_ME_SEQ_NO		NUMBER(8)
WM_ME_BEG_DTE		DATE
WM_ML_ID		VARCHAR2(10)
WM_PROJ_TASK_CODE		VARCHAR2(5)
WM_EP_ID		VARCHAR2(10)

SQL> DESC AXT.WELL_DEV_EVENT

Name	Null?	Type
WELL_DEV_COMMENT		VARCHAR2(200)
WELL_DEV_METHOD	NOT NULL	VARCHAR2(10)
WELL_DEV_END_DTE		DATE
EP_ID	NOT NULL	VARCHAR2(10)
ENV_PROJ_TASK_CODE	NOT NULL	VARCHAR2(5)
ML_ID	NOT NULL	VARCHAR2(10)
ME_BEG_DTE	NOT NULL	DATE
ME_SEQ_NO	NOT NULL	NUMBER(8)

SQL> DESC AXT.WELL_INSTALL_EVENT

Name	Null?	Type
WI_MEAS_ELEV		NUMBER(8,2)
WI_EQUP_LOG_FLG	NOT NULL	VARCHAR2(1)
WI_COMMENT		VARCHAR2(200)
WI_DEV_LOG_FLG	NOT NULL	VARCHAR2(1)
WI_COMPL_DTE	NOT NULL	DATE
WI_CONST_CONTCTR		VARCHAR2(25)
EP_ID	NOT NULL	VARCHAR2(10)
ENV_PROJ_TASK_CODE	NOT NULL	VARCHAR2(5)
ML_ID	NOT NULL	VARCHAR2(10)
ME_BEG_DTE	NOT NULL	DATE
ME_SEQ_NO	NOT NULL	NUMBER(8)
DE_ME_SEQ_NO		NUMBER(8)
DE_ME_BEG_DTE		DATE
DE_ML_ID		VARCHAR2(10)
DE_PROJ_TASK_CODE		VARCHAR2(5)
DE_EP_ID		VARCHAR2(10)

SQL> DESC AXT.WELL_MOD_EVENT

Name	Null?	Type
WELL_MOD_ACT		VARCHAR2(80)
WELL_MOD_COMPL_DTE	NOT NULL	DATE
WELL_MOD_TYP	NOT NULL	VARCHAR2(25)
WELL_MOD_COMMENT		VARCHAR2(200)
WELL_MOD_MEAS_ELEV		NUMBER(8,2)
EP_ID	NOT NULL	VARCHAR2(10)
ENV_PROJ_TASK_CODE	NOT NULL	VARCHAR2(5)
ML_ID	NOT NULL	VARCHAR2(10)
ME_BEG_DTE	NOT NULL	DATE
ME_SEQ_NO	NOT NULL	NUMBER(8)

DISTRIBUTION

1. J. B. Atwater
2–4. T. S. Ball
5. D. T. Bell
6. H. L. Boston
7. C. E. Brandon
8. C. C. Brandt
9. S. N. Burman
10. J. G. Calfee
11. R. B. Clapp
12. H. D. Clark
13. R. B. Cook
14. D. Crenshaw-Smith
15. R. W. Fortune
16. D. L. Fucate
17. M. E. Garland
18. P. J. Gerbic
19. E. L. Hannahs
20. J. J. Herbert
21. D. D. Herr
22. D. S. Hicks
23. S. K. Holladay
24. C. G. Holmes
25. L. A. Hook
26. D. A. Hopper
27. B. M. Horwedel
28. M. M. Langdon
29–31. D. M. Matteo
32. R. A. McCord
33. G. R. Moline
34. R. R. Morgan
35. R. J. Olson
36–37. P. T. Owen
38. J. W. Peterman
39. D. C. Schmoyer
40. P. A. Schrandt
41. C. A. Serbin
42. D. W. Smith
43. M. M. Stevens
44. J. H. Stout
45. R. J. Stout
46. S. D. VanHoesen
47. M. W. Ward
48. D. R. Watkins
49. J. M. Wheeler
50. J. L. Williams
51. K. A. Wilson
52. P. S. Wood
53. R. L. Wright
54. Central Research Library
55–57. ER Doc. Mgmt. Center
58–60. ORNL Doc. Mgmt. Center
61. Laboratory Records Department
62. ORNL Patent Section

63. C. L. Callis, CDM Federal Programs Corporation, 701 Scarboro Road, Oak Ridge, TN 37831
64. M. C. Charko, CDM Federal Programs Corporation, 701 Scarboro Road, Oak Ridge, TN 37831
65. C. C. Inman, CDM Federal Programs Corporation, 701 Scarboro Road, Oak Ridge, TN 37831
66. J. W. Jones, Gilbert/Commonwealth Engineers & Consultants, 1055 Commerce Park Drive, Suite 200, Oak Ridge, TN 37830
67. M. K. Jones, CDM Federal Programs Corporation, 701 Scarboro Road, Oak Ridge, TN 37831
68. P. A. Lesslie, Science Applications International Corporation, 800 Oak Ridge Turnpike, Oak Ridge, TN 37831
69. D. McCurry, CDM Federal Programs Corporation, 701 Scarboro Rd., Oak Ridge, TN 37831
70. G. R. Miller, ECE,
71. S. R. Pack, Science Applications International Corporation, 800 Oak Ridge Turnpike, Oak Ridge, TN 37831
72. J. K. Thompson, CDM Federal Programs Corporation, 701 Scarboro Rd., Oak Ridge, TN 37831
73. Office of Assistant Manager for Energy Research and Development, DOE Oak Ridge Operations Office, P.O. Box 2001, Oak Ridge, TN 37831-8600
74–75. Office of Scientific and Technical Information, P.O. Box 62, Oak Ridge, TN 37831

DATE
FILMED
5/11/94
END