Plan

Quality Management Plan

Remedial Investigation, Amcast Industrial Corporation Site
Ozaukee County, Wisconsin

Scope I.D.: 02A010

Amcast Industrial Corporation

October 2003

Foth & Van Dyke
consultants · engineers · scientists

Foth & Van Dyke
consultants · engineers · scientists

October 23, 2003

Mr. Scott Hansen
Remedial Project Manager
US EPA Region V
77 W. Jackson Blvd
Chicago, IL 60604

Dear Mr. Hansen:

RE: Quality Management Plan - Amcast Industrial Corporation Site
Ozaukee County, Wisconsin

On behalf of Amcast Industrial Corporation, Foth & Van Dyke is providing to U.S. EPA the report entitled "Quality Management Plan" as part of the Remedial Investigation for the Amcast Industrial Corporation Site, Ozaukee County, Wisconsin.

The report has been prepared in accordance with the Administrative Order on Consent dated February 28, 2003 and U.S. Environmental Protection Agency guidance documents. Appendix C of this report contains an annotated "checklist for reviewing EPA Quality Management Plan". The document addresses USEPA comments e-mailed to Foth & Van Dyke on September 23, 2003.

Attached to this transmittal letter is a table summarizing your comments and where each comment is addressed in this version of the Quality Management Plan.

If you have any questions concerning this report, please contact us at (920) 497-2500.

Sincerely,

Foth & Van Dyke and Associates, Inc.

Stephen V. Donohue, P.H.
Senior Project Manager

Steven J. Laszewski, Ph.D.
Associate

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USEPA Comments and Response Location

Comment	Response
1. Management and Organization, Section 3	
1.a Only Foth & Van Dyke personnel must approve the Foth & Van Dyke QMP. The USEPA Remedial Project Manager (RPM) cannot approve the quality system used by Foth & Van Dyke.	Title page – RPM signature line removed.
1.b The location of the Technical Director (Section 4.3), who is in charge of certification of Technical Coordinators within Foth & Van Dyke should be provided. The organizational chart 3-1 does not include this information	Figure 3-1, page 4.
2. Quality System Components, Section 4	
2.a The QMP should clearly identify who is responsible for QMP preparation, revision review and approval.	Section 4.4.1, page 8.
2.b The project planning Section 4.4.2 should provide more details about the systematic planning process. The guidance used for the systematic planning of projects (data quality objectives) should be referenced in the QPM.	Section 4.4.3, page 11.
2.c The USEPA and Region 5 guidance used for QAPP preparation should be referenced in Section 4.4.3 of the QMP.	Section 4.4.4, page 11.
3. Computer Hardware and Software, Section 8	
3.a Section 8.3.6, Environmental Data Management and Data Quality should be located/referenced in the project planning section 4.4.2.	Section 4.4.2, page 11.
4. Planning, Section 9	
4.a The detail process for developing, reviewing, approving, implementing and revising QAPPs should be described in this section.	Section 9.3, page 31.

Comment	Response
4.b USEPA requirements for QAPP preparation (QA/R-5) and Region 5 Instructions in Preparation of a Superfund Division QAPP, June 2000, should be referenced in this section.	Section 9.3, page 31.
4.c This section should identify the acceptance criteria for results or measurements of performance by which customer satisfaction will be determined.	Section 9.3, page 31.
5. Quality Improvement, Section 12	
5.a It should be identified in this section, if the re-analysis of the samples is not possible due to holding times, then re-sampling will be performed.	Section 12, page 38.

Quality Management Plan
Remedial Investigation Amcast Industrial Corporation Site
Ozaukee County, Wisconsin

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Quality Management Plan (QMP)
Remedial Investigation Amcast Industrial Corporation Site
Ozaukee County, Wisconsin

Scope ID: 02A010

Prepared for
Amcast Industrial Corporation

Prepared by
Foth & Van Dyke and Associates Inc.

October 2003

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Quality Management Plan
Remedial Investigation, Amcast Industrial Corporation
Ozaukee County, Wisconsin

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1. Introduction

This Quality Management Plan (QMP) has been prepared by Foth & Van Dyke, the Supervisory contractor for the Amcast Industrial Corporation Remedial Investigation (RI) at the Amcast facility in Cedarburg, Ozaukee County, Wisconsin. As required by the February 28, 2003 Administrative Order on Consent and Statement of Work (AOC/SOW) for Remedial Investigation, Cedar Creek Site, Ozaukee County, Wisconsin, this QMP has been prepared in accordance with "EPA Requirements for Quality Management Plan (QA/R-2) (USEPA, 2001b)."

The purpose of this document is to present Foth & Van Dyke's organizational commitment to quality work products. This document also presents our processes and procedures for implementing and assessing the effectiveness of our quality system.

This QMP is an umbrella document under which various Foth & Van Dyke projects are conducted. Project specific plans (e.g., the Quality Assurance Project Plan/Field Sampling Plan) will also be provided under separate cover to the United States Environmental Protection Agency (USEPA), per the requirements of the AOC/SOW for the Amcast Remedial Investigation project.

2. List of Common Acronyms Used in the QMP

Acronyms	Definition
AOC	Administrative Order on Consent
BRA	Baseline Risk Assessment
CADD	Computer Aided Drafting & Design
CBA	Current Best Approach
CEO	Chief Executive Officer
CAR	Corrective Action Request
CCO	Chief Contracting Officer
COC	Chain of Custody
DQOs	Data Quality Objectives
EDM	Environmental Data Management
FSP	Field Sampling Plan
HASP	Health and Safety Plan
IE	Infrastructure and Environment
IP	Internet Protocol
IS	Information System
LAN	Local Area Network
PMBOK	Project Management Book of Knowledge
PMI	Project Management Institute
PPD	Project Planning Document
PQAP	Project Quality Assurance Plan
PS	Production Systems
RCM	Resource Center Manager
RI	Remedial Investigation
QA	Quality Assurance
QAO	Quality Assurance Officer
QAPP	Quality Assurance Project Plan
QC	Quality Control
QMP	Quality Management Plan
QRA	Qualifications, Responsibilities and Authorities
SAP	Sampling and Analysis Plan
SBU	Strategic Business Unit
SOW	Statement of Work
USEPA	United States Environmental Protection Agency
WAN	Wide Area Network
WDNR	Wisconsin Department of Natural Resources

3. Management and Organization

3.1 Quality Assurance Policy Statement

Foth & Van Dyke defines quality at both the overall project management level and at the technical level. Overall project quality is defined as:

> *A quality work product simultaneously meets the needs of our client, the public, and our company in such a way that results in satisfaction to all participating stakeholders*

Foth & Van Dyke's technical quality vision is:

> *That anyone within Foth & Van Dyke receiving a technical work product, at any stage of development, is confident that it is consistent, correct, and meets the technical objectives established for the project.*

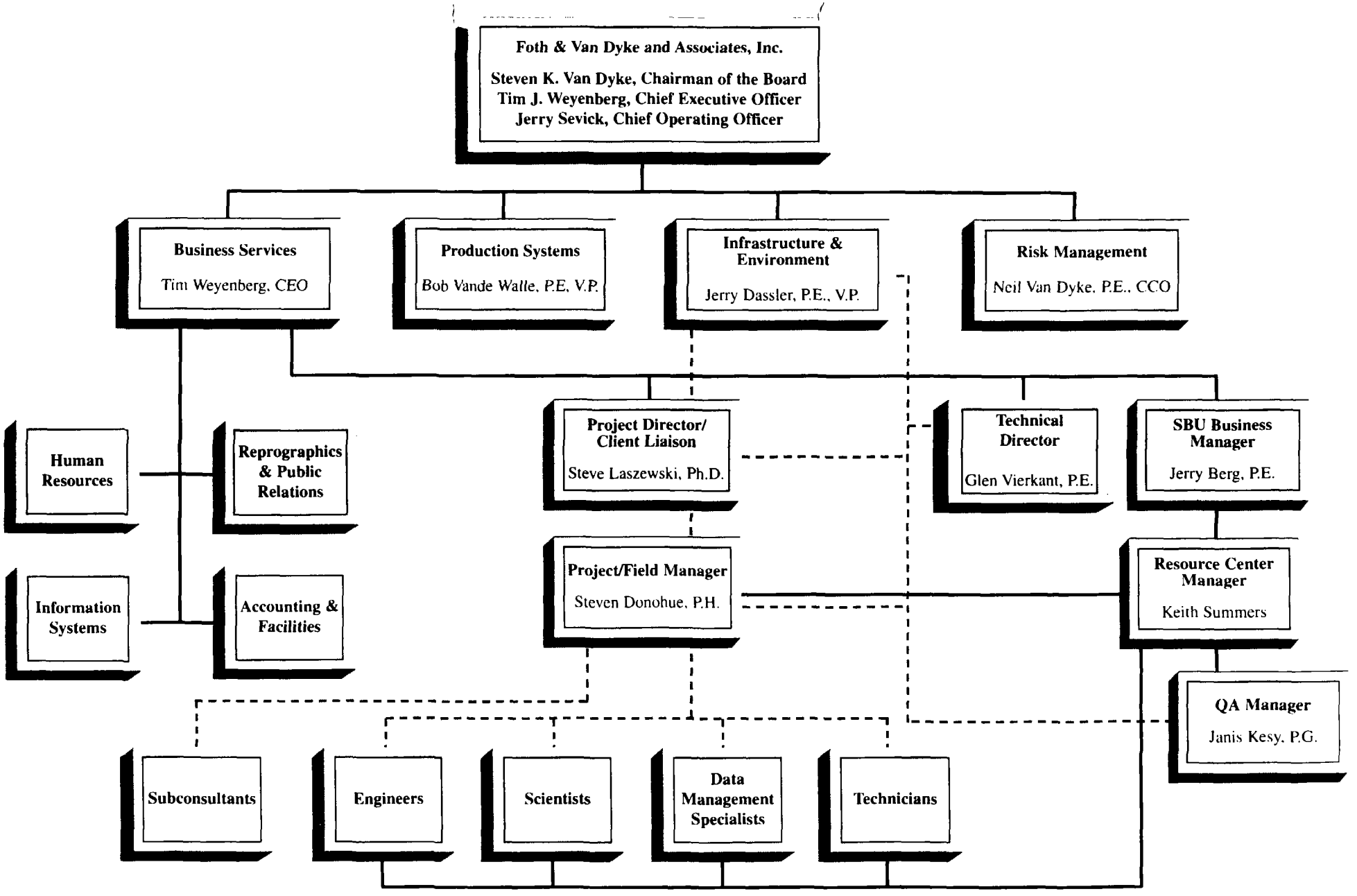
The ultimate responsibility for the production of a quality work product resides with the firm's Chief Executive Officer (CEO). Under the purview of the CEO, Project Directors are responsible for project delivery while Technical Directors are responsible for the technical quality of work products.

3.2 Organization

Foth & Van Dyke is divided into three strategic business units or SBUs. The two externally focused SBUs are the Production Systems (PS) SBU which primarily provides high-speed packaging engineering services, and the Infrastructure and Environment (IE) SBU which provides civil and environmental engineering services. Figure 3-1 illustrates an organization chart for Foth & Van Dyke.

Work on the Remedial Investigation, Amcast Industrial Corporation, Ozaukee County Site will be performed by the Infrastructure and Environment (IE) SBU. The reporting/communications structure of key project stakeholders, including upper management, quality assurance manager, project manager, project team members and subconsultants is also shown on Figure 3-1.

The quality assurance manager (QA Manager) will work with the project team members responsible for the collection, evaluation and reporting of data. The QA Manager will be in contact with the Project Manager and Project Director to monitor project quality and affect quality improvement as needed. The QA Manager will work with the Project Manager and Project Director to establish stringent quality assurance and quality control measures for the sampling and analysis phase of the project and document the required quality procedures in the project's Quality Assurance Project Plan (QAPP) and Field Sampling Plan (FSP). The Project Director, Project Manager, and all project team members, including subconsultants, responsible for sampling and analysis tasks will receive a copy of the QAPP/FSP and be responsible for following the protocols in the documents.



KEY

——— Reporting/Corporate Organization

- - - - - - - Project Organization

AMCAST INDUSTRIAL CORPORATION

FIGURE 3-1
REMEDIAL INVESTIGATION
FOTH & VAN DYKE ORGANIZATION CHART

The Project Manager and QA Manager will assign a lead field technician or scientist to conduct a QAPP/FSP preconstruction meeting to discuss the contents of the QAPP/FSP and the associated responsibilities of all team members included with sampling and analysis tasks. The QA Manager, Project Manager and Project Director will also be required to attend the meeting.

Technical activities requiring quality management include:

- Site surveys
- Surface water, groundwater, soil and sediment sampling
- Storm sewer testing and inspection
- Sample preparation and analysis
- Data validation
- Data entry and maintenance
- Document preparation
- Project filing

Oversight of subcontracted (delegated extramural) services may be required for subsurface exploration work, surface water, groundwater, biota, soil and sediment sampling, laboratory analytical services, data validation services, and sewer testing, inspection and/or televising services.

The QA Manager will work with Foth & Van Dyke staff responsible for coordination of subcontracted services to assure that the subconsultants services meet the project quality standards.

The project team will be from the IE SBU, and as such, QA/QC activities between intramural Foth & Van Dyke organizations will not be required. Management of quality for support information systems is discussed in Section 8 of this QMP.

For each project at Foth & Van Dyke it is standard operating procedure to prepare a Project Planning Document (PPD). This document is prepared by the Project Manager, and reviewed and approved by the Project Director and QA Manager. The PPD is then distributed to all team members prior to project commencement. The content of a typical PPD is more fully described in Section 4.4.2.

The PPD, along with the QAPP/FSP, assures understanding and implementation by the project team of all quality programs required for the project.

4. Quality System Components

The delivery of a quality work product at Foth & Van Dyke requires the development and interactive use of the following system components.

- The Current Best Approach Series (i.e., Standard Operating Procedure)
- Project Management System
- Technical Management System
- Project Planning Process
- Project Execution
- Internal Data Management
- Computer Systems
- System Audits
- Management Reviews
- Training

A summary discussion of each of these components follows.

4.1 Current Best Approach Series

The cornerstone of delivering consistent quality work product at Foth & Van Dyke is the Current Best Approach (CBA) manuscripts which document the processes and practices best suited to the delivery of a quality work product. All members use the defined standards including, but not limited to, component and system design, environmental investigation, construction observation, report writing, project accounting and invoicing, software validation, equipment calibration, etc. Every CBA is assigned an owner who is responsible for regular reviews and updates and sharing this information with appropriate members to foster consistent application across the company.

4.2 Project Management System

Corporate project management practices are based upon *"The Guide to the Project Management Body of Knowledge"*, (PMBOK) written and published by the Project Management Institute (PMI) (PMI, 1996).

The project management system has the following general deliverables:

- The accurate definition of project needs.
- The development of an efficient, and effective work plan to meet project needs.
- Effective execution of that work plan.

The Project Manager has the responsibility for the delivery of all objectives (i.e., schedule and quality) on a specific project. The Project Manager is responsible to the corporation's Client Liaison, who is in turn responsible to the client for the overall business relationship between the corporation and that client. The Project Manager is responsible to the Client Liaison for project-specific objectives and is accountable to individual CBA owners for adherence to CBAs. These

accountabilities and responsibilities are reflected in the corporation's Project Manager performance metrics.

Each project has a Technical Coordinator responsible to develop and implement the project specific QA/QC plan. The Technical Coordinator is responsible to the Project Manager for this delivery.

The quality delivery process begins before commencing work with a thorough assessment made of the following factors:

- Technical capability of resources.
- Capacity to meet project needs.
- Providing deliverables within schedule constraints.

During execution, a project-specific Quality Assurance/Quality Control (QA/QC) program is applied to each project. For this remedial investigation project, this program is manifested through a QAPP. Technical reviews for the program are conducted by a "QA Manager" who is defined as a person:

- Having technical knowledge specifically applicable to the scope of the project, and
- Not directly involved in the detailed design or performance of the work being reviewed.

4.3 Technical Management System

Each major competency in the company is to have a Technical Director assigned, who is responsible for the development of standards and CBAs for that competency. Additionally, the Technical Director is charged to certify the competency of Technical Coordinators and recommends them for project assignments based upon the needs of the project and the specific qualifications of Technical Coordinators.

The technical quality master plan which Technical Directors are responsible to implement include the following four major initiatives:

- Developing corporate-wide technical quality program.
- Integrating technical quality management with the corporation's Client Services and Organizational Management programs.
- Collecting, consolidating, and formalizing the use of existing CBAs and initiating the development and use of new CBAs where required.
- Implementing and administering the corporate technical QA/QC program.

4.4 Project Planning Process

Project planning begins when a request for services is received. The project planning process involves the selection of key project team members and the development of the project planning document (PPD) and project quality assurance plans.

While project planning begins with a request for services, it actually takes place throughout a project. As resource plans, schedules and work scopes change, the project plan frequently needs updating. Project planning is a process that occurs as needed until the project is closed out.

4.4.1 Key Project Team Members

Foth & Van Dyke's project team hierarchy is illustrated on Figure 4-1.

Client Liaisons are typically assigned by strategic business unit leaders. A Client Liaison is usually an Officer, Associate, or Project Director of the firm, and is responsible for all business relationships between the corporation and the client. The Client Liaison is expected to have the ability to lead/direct project teams by representing the client's expectations.

The Client Liaison is the primary conduit for communication with the client, is responsible for the communication of the client's expectations to the project team, represents the client on internal project teams, and is conversant with the status and content of all ongoing client projects.

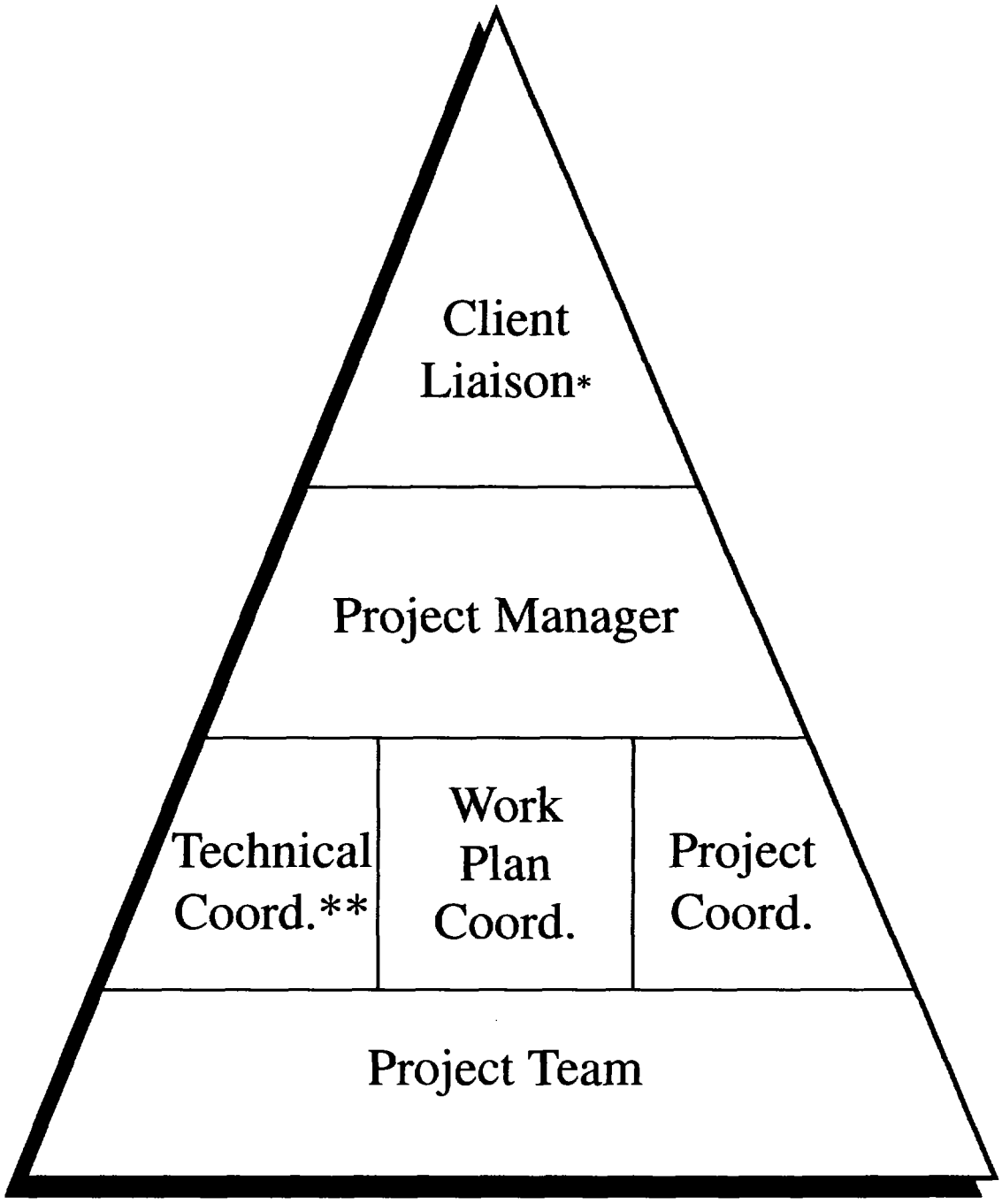
The Client Liaison selects an individual to serve as Project Manager for each particular project. Depending upon the technical complexity of the project, the number of client interfaces, and the risks involved in the project, the individual selected will be either a Project Director or a Senior Project Manager.

The Project Manager provides the following leadership to the project team; is responsible for executing project work in conformity with the contract; manages the scope, budget, schedule and production of the entire project; coordinates the preparation of the quality management plan and revisions; and assists the team in producing a quality work product. The Project Manager also establishes the project team by selecting team members, plans the project (including preparation of the Project Planning Document –see Section 4.4.2), and develops specific work tasks.

In addition to the Project Manager, the Technical Coordinator and QA Manager are responsible to:

- Approve the technical elements of the work scope, level of effort estimates, and completion schedules for projects.
- Prepare the technical quality assurance plan for the project and be responsible for its implementation. (For this remedial investigation, the QA Manager is responsible for QAPP development and adherence to the QAPP by team members.)
- Review and approve the QMP.

Project Team Hierarchy



* Assigned by SBU Leader

** Assigned by Technical Director (the QA Manager is assigned specific technical responsibilities for this remedial investigation)

AMCAST INDUSTRIAL CORPORATION

FIGURE 4-1
REMEDIAL INVESTIGATION
FOTH & VAN DYKE PROJECT TEAM HIERARCHY

GJS/02K

- Coordinate technical work between disciplines.
- Recommend the appropriate technical approach.
- Schedule and conduct technical review meetings.
- Validate critical assumptions and recommendations, equations and calculations, and layouts and drawings.
- Ensure that proper checking of the work has been accomplished.
- Participate in technical presentations with the client as needed during the precontract and work execution phases.
- Ensure that work products are properly sealed in accordance with applicable licensing regulations.

The Work Plan Coordinator, who acts as an assistant to the Project Manager, is responsible for all non-technical project administrative functions including invoices, contracts, cost status reports and other administrative tasks that may be assigned by the Project Manager.

The Project Manager selects as many Project Coordinators as necessary to serve as lead resources for a particular competency. The Project Coordinator then meets with resource center managers to identify resources to complete the project team.

4.4.2 Project Planning

A key element of the project planning process is the development of a project planning document (PPD). The PPD has sufficient detail to direct the project team to deliver a quality work product and sufficiently current to allow another Project Manager to immediately take over the project should the need arise.

The PPD serves as an internal contract for project work. The PPD defines the schedule, clearly spells out responsibilities of team members and the expected quality level for all deliverables. This document obligates internal agreement on the approach to work and deliverables.

The PPD addresses seven major sections, as follows:

- General –contains client information, project goals/key issues, a general introduction to the project, identified client issues, specific technical issues/alerts, and an overall strategy for the project.
- Contract –contains the Professional Services Agreement, the invoicing and billing plan.
- Work Breakdown Structure –contains a list of deliverables; work tasks; resource requirements (including CADD, field equipment, consumables, etc.); and the scope of work by discipline and/or task.

- Project Team –shows the team roles, the staff assigned for each role, and provides a project team chart.

- Schedule –delineates the timeline for project deliverables.

- Communication Format/Plan –includes internal communication expectations, according to project roles and responsibilities; external communication expectations (client, public, regulatory agencies); documentation requirements; correspondence procedures; meeting "rules" and requirements including 30%, 60%, 90% review meetings, project close-out meetings, project team meetings, client meetings, other meetings; and documentation procedures (general, computation, routing list, filing procedures, drawing logs), etc.

- Quality Plan –includes both client requirements and the project standards (i.e., client, Foth & Van Dyke, regulatory and industry). The quality plan also addresses environmental data management and data quality. Details of data management are discussed in Section 8.3.6.

4.4.3 Systematic Planning Process

The data quality objectives (DQOs) process is a systematic planning tool to facilitate the planning of environmental data collection activities. The DQO process has both quantitative and qualitative statements. The DQO process is a seven-step planning approach used to prepare for data collection activities.

The seven steps are:

- State the Problem
- Identify the Decision
- Identify Impacts to the Decision
- Define the Study Boundaries
- Develop a Decision Rule
- Specify Limits on Decision Errors
- Optimize the Design for Obtaining Data

The site-specific DQO process is discussed in the project QAPP. The "Region 5 Instructions on the Preparation of a Superfund Division Quality Assurance Project Plan" (USEPA, 2000) guidance was used in the preparation of the DQOs in the QAPP.

4.4.4 Project Quality Assurance Plans

As part of the Quality Plan referenced in the PPD, when a project involves the collection of significant environmental field data, a Project Quality Assurance Plan (PQAP) is to be prepared. For remedial investigation projects, the PQAP is the QAPP. The QAPP is prepared in accordance with the "Region 5 Instructions on the Preparation of a Superfund Division Quality Assurance Project Plan" (USEPA, 2000). The plan is to address:

- Quality Assurance Program Description
- Organization and Responsibility
- Quality Assurance Targets for Precision, Accuracy and Detection Limits
- Project Activities
- Sample Custody
- Analytical Methods
- Calibration Procedures and Frequency
- Preventative Maintenance
- Routines to Assess Data Precision, Accuracy and Completeness
- Data Reduction, Validation and Reporting
- Corrective Actions
- Performance and System Audits
- Quality Assurance Records
- Other specific requirements as indicated in the project's Statement of Work or Consent Decree.

As needed, analytical laboratories recommended and/or selected by Foth & Van Dyke for the project are to be certified by the appropriate agency(ies) for performance of the tests they will conduct. During the project, the laboratories will be expected to maintain this certification. Laboratory procedures are to be reviewed to ascertain that laboratory data and documents for the project are in compliance with accepted and project-specific QA/QC procedures. The QA Manager for the project will be responsible for such assistance for all analytical data generated.

4.5 Project Execution

At the completion of the initial planning phase, project execution is ready to begin. A kick-off meeting will be held with the project team to review and discuss the contents of the project planning documents and answer any questions team members may have. Assignments are made by the Project Manager to the team members for the tasks, per the agreed-upon work scope. As project execution proceeds, key project team members will participate in review meetings at critical project stages. The purpose of these internal reviews is to discuss the status of project work, identify key issues that need resolution in order to meet project objectives, compare progress against the project PPD, etc.

4.6 Internal Data Management

A systematic process is used to receive, review and enter data into a project's environmental database. A synopsis of the process is provided below.

Data received from the laboratory is verified against the chain of custody (COC) and sampling event requirements. The following minimum report attributes are to be checked:

- Sample points
- Parameters
- Methods
- Limit of detection, limit of quantification
- Holding times
- Units
- Anomalous data

If data are incomplete, or potentially inaccurate, a data challenge is issued. The challenge response from the laboratory is reviewed for completeness and accuracy by the QA Manager.

Field and laboratory data that are accepted as complete and accurate are entered into the project's environmental database. Data that have been uploaded or entered into the project's database are checked for data entry accuracy against the field report and/or laboratory report. The signed hard copy of the field form becomes the official field report. The signed hard copy of the laboratory report becomes the official laboratory report when electronic data are received from the laboratory. A more detailed description of the data management process is presented in Section 8.3.6.

4.7 Computer Systems

Quality system components for computer related applications are described in Section 8.

4.8 System Audits

System audits are performed to regularly monitor project delivery and technical quality management systems. System audits are further discussed in Sections 11.2 and 11.3.

4.9 Management Reviews

The corporation continually monitors project performance through both Project Management and Technical Audit Programs. Feedback from the programs is used to make system improvements and improve CBAs. Management reviews are further discussed in Section 11.1.

4.10 Training

Personnel training and development consists of mandatory training, team role specific training, various leadership development training, and technology development training. Mandatory training encompasses various software and associated standards, health and safety, sexual

harassment and corporate policy review/updates. Depending upon the position/role a member has in the organization, certain team role certification and/or leadership training may also be required. Certification training encompasses specific leadership and technical training specific to job function. For example, Project Managers receive a general series of leadership/interpersonal skills training as well as a set of skill specific training in project management areas, while CADD operators receive continual training to maintain their proficiency as software packages evolve.

Various other options for leadership development training, aimed at developing skills that may have been identified as improvement areas through performance assessments are also available. These may include time management, delegation, multi-tasking, conflict resolution, change management, etc. Participation in these sessions is elective and driven by a member's individual professional development plan. Furthermore, considerable investments are made in technology/discipline specific training.

Additional details of personnel training opportunities and requirements are presented in Section 5.

5. Personnel Qualifications and Training

Foth & Van Dyke recognizes the need for continuing education to match the growth of knowledge associated with its activities and operations. It recognizes too, that members will require additional education or training beyond that obtained in previous schooling or on the job training. As a result, the company has made available to members various training/professional development opportunities. Project Directors will consult with Project Managers, Technical Directors and engineers/scientists to establish specific training requirements (if any) for a particular project. Technical Directors typically take a lead role coordinating engineering and scientific training programs.

5.1 Professional Career Development Program

The professional career development program defines the process by which members can continually enhance their capabilities in response to meeting project needs. The program defines career options through which Foth & Van Dyke members may progress through the organization. There are multiple career tracks by which a member may progress. Each career track includes a number of levels or positions. Each level/position is described via a Qualification Responsibilities and Authorities (QRA) description which includes the Qualifications required, Responsibilities included and Authorities granted by position. The program is driven by the member, facilitated and managed by the member's Resource Center Manager, with input from the member's mentor and respective technical competency (discipline) leader (Technical Director). The Technical Directors are responsible for maintaining, for each member within their respective discipline, a training matrix including required training and completed training. This information is used as input to a member's professional development plan.

5.2 Internal Training Certifications

The team role certification process facilitates the exchange of information (tools and techniques) needed by team members to function in their respective project team roles. Certifications into various team roles are driven by Foth & Van Dyke's Professional Career Development Program and are identified as requirements for specific positions based on the position's QRA. The various internally designed/facilitated team role certification programs which may be required of certain roles/positions include:

- Client Liaison Certification
- Project Manager Certification
- Project Coordinator Certification
- Organizational Development (Resource Management) Certification
- Work Plan Coordinator Certification
- Technical Coordinator Certification

Team role certification programs include a leadership/interpersonal skills component, a technical/systems/processes skills component and an on-the-job coaching component. A system owner (Director level individual within the company) is responsible for ensuring that the programs are in place, pre-approving entry into the program (as identified via the members professional

development career plan), and ultimately granting "certification" once the member has completed the training and demonstrated abilities to function within the role.

5.3 Training and Education, Conferences, Seminars, Trade Shows

Foth & Van Dyke encourages members to increase their job skills and technical knowledge. This is accomplished through attending training sessions, educational courses, conferences, seminars, and/or trade shows.

5.4 Tuition Aid

Foth & Van Dyke encourages members to continue their education. All tuition aid courses/programs must be approved by Foth & Van Dyke's recognized accrediting agencies. In order to be eligible for tuition aid, a regular full-time member must be enrolled in a degree program and the course(s) must be recognized as approved credits toward the degree program, or the course(s) must be taken to maintain a registration or certification. Upon completion of the course/program and evidence of a grade of "A or B" or certification of successful completion of a program, reimbursement is at 100% of the total program cost and will include tuition, books, and laboratory fees. All reimbursements are issued after final grades have been received.

5.5 Memberships

Members are encouraged to participate in technical societies and professional organizations. The company expects members to participate as active members of these organizations where the company pays the fee.

5.6 Licensing, Certification, or Professional Registration

State laws require registration and/or licenses for many of the tasks which the company performs. Present assignments or level of responsibility may require our members to pursue registration or accreditation in their respective field of specialty.

5.7 Subscriptions/Publications

As a supplemental means of staying current in an member's area of expertise, subscriptions/publications are available to members.

5.8 Training Tracking

All internal and external training that a member has been approved to attend and/or attended, is recorded and tracked in Foth & Van Dyke's training tracking database. Information within this database is maintained by Human Resources and accessible to any member upon request.

5.9 QA Training – Foth & Van Dyke Management and Staff

Foth & Van Dyke management and staff maintain knowledge in QA-related activities through internal and external training in quality-related topics. Retraining is scheduled when/if changes

occur in regulatory requirements, methods, etc. Training and/or retraining may include topics such as: chain-of-custody procedures, sample shipping and handling, field instrument calibration procedures, procedures for sampling and containerizing, analytical procedures, data reduction, validation and reporting, performance standards and audits, internal quality control procedures, corrective actions and quality assurance reporting.

6. Procurement of Items and Services

The procurement of items and services for carrying out the tasks associated with this project are listed below:

- Computer hardware and software for data management, data evaluation and data presentation.
- Field equipment and associated consumables and other miscellaneous items.
- Procurement of services for laboratory analysis, site mapping, soil borings and other field-related services.

The process for procurement of computer hardware and software is described in detail in Section 8 of this QMP.

Procurement of field equipment and associated consumables and other miscellaneous items is as follows:

- Project engineers and scientists responsible for field sampling identify required equipment and consumables for media being sampled.
- Project Manager reviews the requested items for compliance with requirements of the Field Sampling Plan (FSP) and forwards the request to the QA Manager.
- QA Manager reviews the request for compliance with the QAPP/FSP and approves the request, or modifies it as necessary to make it compliant, and return the request to the Project Manager.
- Project Manager presents the approved request to the SBU Business Manager for purchase authorization.
- Project Manager returns the approved request to the initiating lead engineer or scientist who will contact the supplier and make the purchasing arrangements.
- Initiating project engineer or scientist reviews the materials upon receipt for conformance with the order placed.
- Any nonconforming materials are returned to the supplier.

Procurement of subcontracted services is initiated by the Project Manager. In the case of analytical laboratory services, the lead scientist for the project is tasked with developing a list of analytes and required analytical methods in accordance with the QAPP/FSP. Only laboratories with quality programs and certifications meeting QAPP requirements are considered. As part of the laboratory services procurement process, the Foth & Van Dyke QA Manager reviews laboratory quality programs and certifications for compliance with the above stated requirements.

When quotations for analytical services are received, the Project Manager prepares subcontractor agreement(s) for the selected subcontractor(s), which includes a scope of services and cost, and contractually obligates the subcontractor to the project quality requirements.

While the above description details the analytical laboratory services procurement procedure, the same general process including review by the Foth & Van Dyke QA Manager, is used for all subcontracted services.

7. Documents and Records

The Corporation's Quality System components (described in Section 4) include standard operating procedures termed CBAs. These CBAs are assigned to owner's responsible for maintenance and updating as required. An updated index to all current CBAs is maintained on the corporation's Intranet system for access by all employees. Only the CBA owners have the authority to add, remove or modify CBAs.

Facilitating the preparation, issuance, use and revisions to project specific quality-related documents such as this QMP and the QAPP is the responsibility of the Foth & Van Dyke Project Manager. Review of quality-related documents and revisions thereof will be performed by the Foth & Van Dyke QA Manager prior to issuance.

Documentation of completed work will be prepared by various team members and reviewed by individuals selected by the Project Manager. The Technical Coordinator is responsible to ensure that all calculations and data presented or used for evaluation are checked. The initials of the preparer and reviewer are placed on all pertinent calculations and data tabulations. Checking of electronic data is described in Section 8.3.6.

The Foth & Van Dyke Project Manager is responsible for distribution of documents, and any subsequent revisions, to the appropriate stakeholders. The Foth & Van Dyke Project Manager will also make the current versions of the documents available to all Foth & Van Dyke team members, through use of a Project Master Filing System.

When revisions to existing documents are issued, all recipients will be advised to replace the obsolete pages with the revised ones, and to discard the obsolete pages.

All documents and records in the Master Filing System are indexed and filed chronologically by category. All documents and records associated with a particular project will be filed with a unique alphanumeric scope identification (e.g.,02A010 for the Amcast project).

Electronic copies of documents and records are maintained on the corporation's computer network. Each project is assigned a unique alphanumeric scope identification (e.g., 02A010) to house electronic files prepared for the specific project. Examples of electronic files include environmental databases, correspondence, documents, survey data, and project drawings. Project information on the corporation's computer network is backed up daily and archived to tape/disk format for storage at project completion. Retention of documents and records are as required by the Administrative Order on Consent (AOC) for the project.

7.1 Sample Custody Procedures

A sample is in custody if it is in actual physical possession or it is in a secured area restricted to authorized personnel. Proper chain-of-custody procedures minimizes errors by assigning responsibility to all stages of sample handling which ensures that problems are detected and documented if they occur.

Sample custody procedures are necessary to prove that the sample data corresponds to the sample collected. A complete, detailed, unbroken chain-of-custody chain for a sample allows documentation and data to substitute for the physical evidence of the samples in a civil courtroom.

The QAPP will discuss the details regarding the scope and level of sample custody needed for the Amcast Remedial Investigation which will include the following:

- Names and responsibilities for sample custodians in the field and laboratories
- Sample number system
- Plans for maintaining sample integrity in the field (e.g., proper temperature and preservatives)
- Methods of sealing shipping containers with chain-of-custody seals.
- Procedures for maintaining chain-of-custody during transfer from field to laboratory within the laboratory, etc.
- Method and forms for archiving of all shipping documents and associated paperwork.
- Procedures for ensuring sample security.
- Documentation of consumption and disposal of samples.
- Discussion of details regarding sample storage (in transit and in the laboratory), transportation and delivery to the analytical facility.

8. Computer Hardware and Software

8.1 Introduction

Foth & Van Dyke's ability to delivery of high quality projects is dependent upon a strong and stable Information Systems infrastructure. Meeting our corporate quality assurance policy statement relies on our ability to deliver critical technology based on meeting a variety of client- or project-specific requirements. The management, delivery, and control of Information Systems infrastructure is critical to the success of our projects.

8.2 Objective

Our objective of delivering high-quality information systems infrastructure is accomplished by:

- Controlling and managing our production environments following industry standards for operational support and change control management.
- Successfully delivering new capabilities and features through institutionalized software development and project management approaches.

8.3 Process

Consistent support and delivery processes are the cornerstones of our ability to deliver the quality and stable Information Systems infrastructure. We accomplish this by following various Foth & Van Dyke Information Systems CBAs.

The organization and responsibilities of the Information Systems (IS) group is illustrated in Appendix A of this QMP.

8.3.1 Software and Hardware Development Process

All development activity for additions, improvements, and updates to our information systems infrastructure are driven by the business requirements and needs of our internal and external customers. A number of different internal processes are used to manage the identification, justification, prioritization, and delivery of the requested activities. Based upon our corporate direction of personalized, client-centered service, IS uses similar processes to support and deliver both external and internal customer requirements. Purchased solutions versus internally developed solutions adhere to the same development process.

For software activities, it is our procedure to work closely with the requestor(s) to clearly define and understand the business requirements. A systematic and disciplined software development process is followed to ensure the delivered solution meets the defined business requirements. The phases of the process, as defined in the Information Systems Software Development Life-Cycle Process CBA, include:

- Requirements definition phase
- Analysis and design phases

- Construction and system testing phases
- Integration and user acceptance testing phases
- Implementation and warranty period phase

Within each of the various phases of the software development life-cycle, required deliverables are developed, reviewed, and approved to ensure successful delivery and completion of the specific phase. The exit criteria for each step requires approval and sign-offs by appropriate project team members.

To ensure quality and successful delivery of projects, the Project Management Institute's (PMI) terminology, processes and knowledge areas are guides for managing project delivery. This information is contained in the PMBOK (PMI, 1996). The PMBOK principles are embedded in the IS procedures described in the remainder of Section 8.

8.3.2 Purchased Hardware and Software Selection Process

If a business requirement generates a need for the introduction of new computer hardware or software technology, an evaluation project phase is initiated to identify and recommend the appropriate technological solution. The phases of the hardware/software selection process are:

- Gather information on the business requirement.
- Develop a hardware/software criteria checklist for use in the selection process. Each criteria/requirement is categorized into one of two groups; a "must have" and "want to have" criteria group.
- Identify list of all potential solution providers.
- Perform initial evaluation and reduce solution providers to the top candidates.
- Develop a hardware/software questionnaire and distribute to selected providers.
- Evaluate and grade questionnaire responses against the criteria checklist.
- Schedule solution provider presentations and product demonstrations. Where appropriate, site visits should also be scheduled.
- Rank each solution provider against the evaluation criteria.
- Make formal recommendation.
- Once approved, an implementation project is initiated.

8.3.3 Computer Hardware and Software Acquisition

The acquisition of any computer related hardware and software purchase is justified and approved following the Foth & Van Dyke Preapproval Process CBA, as summarized below:

- Project Director, Project Manager, Technical Director or team member define need.
- Resource Center Manager (RCM)/Business Manager assess need (initial decision).
- Pre-approval form completed by RCM and reviewed by appropriate IS Specialist and competency Technical Director.
- Operations Officer makes final decision.
- Accounting administrative support issues P.O.
- RCM executes purchase.

8.3.4 Vendor Selection Process

The vendor selection process follows a similar process used in the identification and selection of the hardware and software selection process. Additionally, information included within the vendor selection process includes staffing, skills, and expertise level.

8.3.5 Operational and Change Management Process

Our business requirement to have information systems available 24-hours per day, seven days a week requires a disciplined approach to maintaining and supporting our technical infrastructure. Defined standards and procedures identified include:

- Personal support coverage hours, after-hours contacts, and escalation procedures.
- Maintaining schedules of applications and system level backups and processes for business continuity and disaster recovery purposes.
- Virus management software and procedures implemented to protect our infrastructure from both internal and external intruders.
- Corporate security and network management level controls to ensure data level access is granted and restricted for appropriate personnel.

8.3.5.1 Computer Password and Building/Phone Security Code Protection

A member's personal password and building/phone security code (where appropriate) is the signature by which the system recognizes him/her. It is vital that a member protect it. Members do not disclose their password and/or building/phone security code to anyone, as it is confidential.

Each member is required to create a personal password and is given a building/phone security code where appropriate (within the guidelines set forth by Business Services) to allow him/her to access and operate our systems. Giving his/her IDs to another person for use is grounds for suspension and/or termination of employment.

Use of another person's ID under any circumstances will be grounds for suspension and/or termination of employment for both parties.

8.3.5.2 Computer Virus Protection

The protection of both Foth & Van Dyke and our clients' computer systems from computer viruses is of vital importance. All users of our computer systems must share in the responsibility of keeping those systems virus free. A computer with Foth & Van Dyke's virus checking software is available at each office location for the convenience of virus checking.

There are three major times when it is required to use the virus checking software.

- Any diskette(s) utilized on a computer outside Foth & Van Dyke must be checked by our virus checking software prior to its insertion into our company computers.
- Any diskette(s) received from clients must be checked by our virus checking software prior to its insertion into our company computers.
- Any diskette(s) to be sent to a client must be checked by our virus checking software, after all data have been transferred to the diskette.

If the diskettes are part of a set, the first and last diskette of the set are required to be checked. Failure to adhere to this policy could have very serious ramifications for both Foth & Van Dyke and our clients. Therefore, any member found in violation of the policy is subject to further disciplinary action up to and including termination.

8.3.5.3 Member Use of Personal Computer Software

Foth & Van Dyke licenses the use of computer software from a variety of outside companies. Foth & Van Dyke does not own this software or its related documentation and, unless authorized by the software developer, does not have the right to reproduce it.

With regard to use on local area networks or on multiple machines, Foth & Van Dyke members will use the software only in accordance with the license agreement. Copies of client data files must not be maintained on personal/home computers.

Foth & Van Dyke members who become aware of any attempt to reproduce or misuse software or related documentation within the company shall notify Foth & Van Dyke Information Systems, Business Services or the appropriate Resource Center Manager.

According to the U.S. Copyright law, persons involved with illegal reproduction of software can be subject to civil damages and criminal penalties, including fines and imprisonment. Foth & Van Dyke does not condone the illegal duplication of software. Foth & Van Dyke members who make, acquire, or use unauthorized copies of computer software will be disciplined as appropriate under the circumstances. Such discipline may include termination.

8.3.5.4 Enterprise-wide Electronic Messaging and Internet Use Policy

This policy establishes Foth & Van Dyke's guidelines regarding:

- Appropriate use of electronic messaging systems (E-Mail).
- Dissemination of information sent, received, or stored via electronic messaging systems.
- Monitoring of electronic messaging systems and privacy of information.
- Internet access.
- Backup and recovery of electronic messaging systems.
- Retention of electronic messages.

8.3.5.4.1 Corporate and Remote Location Management

Foth & Van Dyke members are to ensure that individuals granted access to Foth & Van Dyke systems are aware of and comply with the guidelines stated in this policy. They are also responsible for informing appropriate Foth & Van Dyke members if they suspect violations of these guidelines have occurred and for cooperating in the investigation of the alleged violations. Notification of suspected violations should be made to either Foth & Van Dyke Information Systems, Business Services or the appropriate Resource Center Manager.

8.3.5.4.2 Individuals Granted Access to Foth & Van Dyke Systems

Individuals, whether members or not, granted access to Foth & Van Dyke systems are ultimately responsible for complying with Foth & Van Dyke's practices and policy. They are also responsible for informing appropriate Foth & Van Dyke members if they suspect violations of these guidelines have occurred and for cooperating in the investigation of the alleged violations. Notification of suspected violations should be made to either Foth & Van Dyke Information Systems, Business Services or the appropriate Resource Center Manager.

8.3.5.4.3 Corporate Information Systems

Foth & Van Dyke's IS group is responsible for monitoring activity on all Foth & Van Dyke systems, including electronic messaging systems. The results of monitoring activities and the information obtained through monitoring will only be disclosed to appropriate levels of Foth & Van Dyke management on a need-to-know basis. Information systems monitoring, particularly for email/Internet usage violations, will be done on a random basis at the discretion of the information systems group. This random monitoring will take place no more than four (4) times per year, unless suspected violations are occurring.

8.3.5.4.4 Use of Electronic Messaging Systems

Foth & Van Dyke's electronic messaging systems including Internet, like other computing resources, are intended for conducting company business only. Use of these systems may be authorized by managers for projects related to Foth & Van Dyke sponsored education and training or community support. Foth & Van Dyke will tolerate incidental and/or occasional personal use of its electronic messaging systems provided that use does not adversely affect business uses and/or does not involve a specific list of prohibited activities presented in the Foth & Van Dyke Member Handbook.

8.3.5.4.5 Monitoring of Electronic Messaging Systems

All information on company computer systems, including electronic mail, is the property of Foth & Van Dyke. Therefore, to ensure that computing resources are used in accordance with expectations, management may, at any time and without advance notice, inspect and disclose the contents of electronic messages if such inspection and disclosure is made pursuant to legitimate business purposes or as necessary to protect the rights and property of Foth & Van Dyke. This monitoring activity may limit the level of privacy that members can reasonably expect to be provided for information they store on computers or transmit and receive via electronic mail or other communications media. Violations of Foth & Van Dyke guidelines discovered as a result of monitoring/auditing activities may be grounds for disciplinary action. In addition, illegal activities discovered as a result of monitoring/auditing activities may be brought to the attention of an appropriate government agency.

Note that electronic messaging systems, as well as other computer systems, are subject to the right of discovery in legal actions brought against Foth & Van Dyke. This means that outside parties may have access to the information stored on Foth & Van Dyke systems and as a result of the discovery process such information may become public knowledge through no fault of Foth & Van Dyke.

8.3.5.4.6 Internet Access

Foth & Van Dyke will provide access to the public Internet for the basic functions of e-mail, file transfer, world-wide-web browsing, and interactive terminal access, where the use of those services is necessary to accomplish the business goals of Foth & Van Dyke. All activities and communications conducted over the Internet are subject to the same degree of inspection and disclosure by Foth & Van Dyke as described above. All connections between Foth & Van Dyke's internal network and the Internet that support Internet Protocol (IP) routing must be made through a secure firewall gateway managed by the Foth & Van Dyke IS group. The installation of routers or other devices that support IP networking to access the Internet from computers attached to Foth & Van Dyke networks (LANs, WANs, etc.) is expressly forbidden and may result in appropriate disciplinary action.

8.3.5.4.7 Retention of Electronic Mail

Electronic mail messages, whether sent or received (including those posted on electronic bulletin boards), have the same legal status as hard-copy documents and their retention is governed by

established records management guidelines and in some cases government regulation. Individuals are responsible for ensuring compliance with appropriate retention requirements. Normal system backups do not meet the requirements for normal record retention and should not be relied upon to provide it. Individuals should reference Foth & Van Dyke's policies covering records management and retention to determine what information/documents must be retained and the form in which it must be retained.

Additionally, certain projects may have specific retention requirements which supercede standard Foth & Van Dyke policies. The Project Manager is responsible for notifying the project team of any such special requirements.

8.3.5.4.8 Backup and Recovery of Electronic Mail

All electronic messaging systems are backed up on a regular basis. Backups are made primarily to permit the recovery of information when system problems occur. As stated above, these backups should not be relied on to meet retention requirements for electronically generated messages. Where long term retention is required by Foth & Van Dyke policy or government regulation, special arrangements must be made through the IS department by the Project Manager to ensure proper retention and recovery.

Individuals should be aware that because backups are being made, it is possible to recover deleted documents. Monitoring and audit activities may include reviews of documents that individuals have deleted.

8.3.6 Environmental Data Management and Data Quality

Environmental data collection and management follow the Data Quality Objective Process set forth in the September 1994 USEPA guidance document "Guidance for the Data Quality Objectives Process (QA-G-4) EPA-G-4) EPA/600/R-96/055".

The first stage of the process defines the types of decisions which will be made regarding site remediation through identifying data users, evaluating available data, developing a conceptual model, and specifying objectives for the project. The model describes suspected sources, contaminant pathways and potential receptors. The model facilitates identification of decisions that must be made and deficiencies in existing information.

The second stage involves specifying the data necessary to meet the objectives set in Stage 1. Stage 2 includes selection of the sampling approaches and the analytical options for the site.

The Stage 3 results in the specification of the methods which data of acceptable quality and quantity will be obtained to make decisions.

Data quality is maintained by following Foth & Van Dyke's Environmental Data Management (EDM) standard operating procedures. A flowchart of this process is illustrated in Appendix B.

Access to each client's EDM information is secured and controlled to individual members requiring access to such data. Read and update access is granted on an individual level basis based upon approved authorization. The EDM Database Security CBA is summarized as follows:

- Security rights for project databases are assigned to two network groups (EDM readers and Foth & Van Dyke EDM users).
- EDM readers have rights to read information from databases.
- Foth & Van Dyke EDM users have rights to read, add or correct information in the databases.
- Changes in member rights are only accepted from the client liaison for the client facility, with input from the PM and TC.

9. Planning

9.1 General

This project includes the review of previous environmental data, planning for the collection of additional environmental data, collection and analysis of additional field samples, and use of existing data and new data to characterize site conditions.

This QMP along with the RI Work Plan, Health and Safety Plan (HASP), QAPP, FSP, Baseline Risk Assessment (BRA) (if conducted), and Remedial Investigation (RI) Report require review and approvals at each project milestone by project stakeholders including USEPA, WDNR, Amcast and the Foth & Van Dyke Project Team. Therefore, the environmental data needs and desired quality will be addressed and approved through the internal and external review processes.

9.2 Description of the Systematic Planning Process for Environmental Data Operations

The Sampling and Analysis Plan (SAP) has two parts, the Quality Assurance Project Plan (QAPP) which describes the policy, organization, procedures, quality assurance and quality control protocols and performance criteria needed to meet the Data Quality Objectives (DQOs) dictated by the intended use of the data, and the Field Sampling Plan (FSP) which provides guidance for all field work by defining in detail the sampling and data gathering methods. The following is a brief outline of the QAPP and FSP.

FSP

- Site background
- Sampling objectives, including questions and issues to address
- Sampling types, location and frequency
- Sample labeling, handling, transportation and chain-of-custody procedures
- Sample equipment and operating procedures
- Potential constraints on data collection
- Sample analysis
- Schedule for field sampling and laboratory analysis

QAPP

- Project description
- Project organization and responsibility, including identification of supplies (e.g., analytical laboratory, drilling/sampling contractors, etc.)
- Project QA objectives
- Sampling procedures
- Chain-of-custody procedures
- Field equipment calibration procedures
- Laboratory analytical methods
- Field and laboratory data reduction, validation and reporting
- Foth & Van Dyke internal quality control
- Performance and systems audits

- Preventive maintenance
- Data assessment procedures
- Corrective actions
- Quality assurance reports

9.3 Quality Assurance Project Plan (QAPP) Development

The purpose of the QAPP is to define in detail how quality assurance and quality control activities will be implemented for a project. The following documents are used for the development of QAPPs "EPA Requirements for Quality Assurance Project Plans for Environmental Data Operation", EPA QA/R-5, March 2001, and "Region 5 Instructions for the Preparation of a Superfund Division QAPP", USEPA, June 2000.

QAPP development is lead by the project QA Manager with assistance from appropriate project team members. QAPPs have a pre-QAPP meeting coordinated by the project manager to include the QA manager, potential responsible party (PRP), state agency, USEPA Region 5 RPM and QAPP reviewer, and analytical laboratories. The meeting includes the discussion of project description, data quality objectives of the project, intended data usage, sampling procedures, safety issues, parameters, sample types, analytical methods, laboratory performance and system audits, data validation and data quality assessment.

The QAPP is then prepared in accordance with "Region 5 Instructions in the Preparation of a Superfund Division QAPP" (USEPA, June 2000). The QAPP is reviewed by Foth & Van Dyke QA Manager. The QA Manager reviews the draft QAPP using Region 5 Superfund QAPP checklist (USEPA, June 2000). Once approved, the draft QAPP is then submitted to USEPA Region 5 for review and approval. If USEPA has comments on the QAPP, these are provided to the Project Manager. The Project Manager and QA Manager have a conference call with the USEPA RPM to discuss the comments. The QA Manager takes the lead in QAPP revisions using appropriate project team members. The revised QAPP is then submitted to USEPA for approval and signature. The QAPP will then be implemented as approved.

If revisions to the QAPP and/or FSP become necessary during project implementation, the changes will be discussed between USEPA, WDNR, the PRP and the Foth & Van Dyke Project Manager and QA Manager. Approved changes will then be made to the QAPP and/or FSP as an addendum or revised pages, and copies of the addendum or revised pages will be distributed by the Foth & Van Dyke Project Manager to all recipients of the QAPP/FSP.

Previous analytical data from other sources that have been submitted to the WDNR and USEPA in reports (e.g., Strand Associates, Inc., 1992) will be accepted as meeting quality requirements imposed by the approval process at the time those reports were prepared.

The data will be reviewed for obvious typographical or positional errors, and any errors identified will be clarified in project reports.

Project field and laboratory data will be evaluated through reviewing the data sets to determine the conformance to the requirements specified in the approved QAPP. The Foth & Van Dyke QA

Manager is responsible to initiating the data review/validation request to the respective QA reviewer. Data will be assessed in terms of its precision, accuracy, representativeness, completeness and comparability.

The schedule for document preparation, document review and project implementation will be included in the project's RI Work Plan .

10. Implementation of Work Processes

Many activities associated with the type of field work on this project include sample collection or environmental monitoring using standardized procedures. Many of these standardized procedures are included in Foth & Van Dyke's CBA series. Applicable procedures will be included in the projects QAPP and FSP.

The Foth & Van Dyke Project Manager, in consultation with the TC, will be responsible for including the proper procedures in the respective plans, and to identify other procedures that may need to be deleted or modified to meet project needs.

As mentioned in Section 7, the owner of each CBA (generally assigned by competency in related field) is the only party that can create, edit, or remove CBAs from the system.

The Foth & Van Dyke Project Manager will be responsible for monitoring project progress for overall conformance with the planning and technical documents. To facilitate information transfer, the Foth & Van Dyke Project Manager will conduct routine team meetings and visit the site as necessary.

11. Assessment and Response

It is the practice of Foth & Van Dyke to evaluate its quality program on a continual basis through the use of the following mechanisms:

- Management System Reviews
- Project Management System Audits
- Technical System Audits

Each of the three mechanisms, described below, are to be used by officers or senior members of the corporation that have no direct involvement or responsibility for the work being assessed. The individuals conducting the assessments have the authority to change or affect the change needed in systems or processes to achieve or improve quality.

11.1 Management System Reviews

The corporation's Project Management Steering Committee meets monthly to conduct independent assessments of the firm's quality management system. The members of this committee are corporate vice president who owns the Project Management System and senior staff members who are the Project Management System owners from each of our business units. The objective of the review is to assess how the current quality assurance and quality control practices are working and to identify accountability to ensure corrective action is taken as needed to deliver the desired quality work product. The review process is also used to create a high degree of visibility for quality in the organization in addition to a high degree of accountability for its delivery and corrective action, as necessary.

11.2 Project Management System Audits

The Project Management Process Audit Program is to be used to regularly review and monitor project management performance. Through the program we formally audit projects on a random basis for conformance to the corporation's project management CBAs. It is the primary quality assurance method for assessing project management activity and the documentation of project management activity against CBAs. The objective of the program is to identify corrective actions and opportunities for improvement. Audits are performed on a regular basis, with 30 – 40 projects audited each calendar year. The audits are performed by members of the Project Management Steering Committee.

11.3 Technical System Audits

The corporation's Technical Audit Program is used to regularly review technical quality and the process in-place to achieve it, as well as monitor conformance relative to the CBAs for that process. The objectives of the Project Technical Audit Program are to:

- Audit the solution of the problem for merits and improvement opportunities;

- Assess adherence to CBAs, scope documents and project technical communications and;

- Find opportunities to document and improve work processes (CBAs).

Approximately 24 audits are performed each calendar year. Technical audits are conducted by the Technical Directors.

11.4 Dispute Resolution

If disputes are encountered as a result of system audits, they are brought to the Project Management Steering Committee for resolution.

11.5 Corrective Action Program

11.5.1 Program Overview

The corporation's corrective action program is used in the event adequate and timely corrective action for conditions adverse to quality is not obtained through normal systems. A Corrective Action Request (CAR) is used to report unsatisfactory conditions noted within the corporation and/or at project sites. This procedure establishes a uniform method for initiating and promptly processing requests for corrective action to resolve conditions which are not in compliance with the corporation's Quality Program or a sub-contractor's/vendor's Quality Assurance Program, or are otherwise adverse to quality.

11.5.2 Definitions

- **Condition Adverse to Quality** – A condition adverse to quality is one which, if uncorrected, could have a serious effect on operability, or work product quality.

- **Corrective Action** – Measures taken to rectify "*conditions adverse to quality*".

- **Current Best Approach** - The corporation's collection of standards, standard methods and policies. Also known as a CBA.

11.5.3 Responsibilities

- Internal Audits Coordinator
  Initiates CARs resulting from internal audits. Advises Quality Assurance Officer (QAO) of problems and corrective action affecting projects.

- Originator
  Recommends initiation of a CAR to Systems Owner or Client Liaison when in their judgement, the condition is adverse to quality and there is a need for corrective action.

- Quality Assurance Officer (QAO)
  Assigns CAR serial numbers and maintains a master CAR log indicating the status (date initiated, due date, and date closed) for all CAR numbers assigned. The QAO is typically at the Technical Director level within the organization.

- Systems Owner
  Concurs, approves and closes out CARs initiated within their area of responsibility.

11.5.4 Process

11.5.4.1 Basis for Initiation of Corrective Action Request

Initiation of CARs may be based on any one of the following:

- Failure to respond to previous verbal or written requests for corrective action.

- Failure to respond to internal audit findings or to implement corrective actions within the times specified.

- Condition noted is repetitive or indicating that the internal quality system is not functioning correctly.

- Major discrepancies or recurring minor discrepancies not identified in any non-conformance reporting system.

- Conditions noted that are considered to be of major impact to the corporation's quality program or activities.

Any employee conducting inspections, surveillance's, or audits may act as the originator when, in his/her judgement, the condition is adverse to quality and there is need for corrective action.

The Systems Owner shall concur with the need for instituting corrective action.

11.5.4.2 Initiating the Corrective Action Request

When need for corrective action is determined, the originator shall prepare the CAR information on a Corrective Action Request form. The CAR form provides space for recording the specified requirements and conditions found requiring corrective action, identifying the cause of the condition, recording the corrective action taken to resolve the condition, identifying measures taken to prevent recurrence, and closure of the CAR.

11.5.4.3 Review of Corrective Action Request

CARs shall be reviewed and approved prior to issuance as defined below:

Activity	Approval Authority
Internal Audits	QAO
Internal Process	System Owner
Project-Related Activities	Client Liaison

11.5.4.4 Processing the Corrective Action Request

A CAR Status Log to indicate "open" and "closed" status is maintained by the QAO.

The CAR is transmitted to the approval authority listed above.

The organization unit or responsible party is requested to:

- Acknowledge receipt of the form and return a copy of the form to the Originator.
- Complete the corrective action response by the effective date, sign and date the form.
- Return the form (original) to the individual designated in the transmittal letter or memorandum.

The Originator and/or the System Owner shall:

- Review CAR response for completeness and adequacy of proposed corrective action.
- Coordinate verification of the prompt implementation and the effectiveness of the corrective action.
- Complete CAR documentation, including closeout of the item in the CAR Status Log.
- Transmit a copy of the closed CAR to all recipients of the original CAR attached to a letter of transmittal.

12. Quality Improvement

Quality improvement is a continuous process that involves assessments, recommendations and responses to recommendations by project team members, project team leaders, the QA manager, system owners, internal auditors, corporate officers and the corporation's CEO. The assessment and response procedures outlined in Section 11 are the primary mechanisms used to create an environment where conditions adverse to quality are prevented or if they occur, are identified and corrected in a timely fashion. The mechanisms coupled with the corporations project management process described in Sections 4.2, 4.3 and 4.4 encourage members to establish and maintain communications between internal and external customers and suppliers, to identify process improvement opportunities and to identify and propose solutions for these opportunities. Finally, Sections 4 and 11 identify the roles, responsibilities and authorities related to the mechanisms. Project specific data quality procedures, such as the need to re-analyze samples or re-sample are discussed in the project QAPP.

13. References

Strand Associates, Inc., May 1992. *Final Report Cedar Creek PCB Investigation, Volumes 1 and 2*

Project Management Institute, 1996. *The Guide to the Project Management Body of Knowledge.* 1996.

USEPA,1994. *Guidance for the Data Quality Objective Process (QA-G-4).*

USEPA, 2000. *Region 5 Instructions on the Preparation of a Superfund Division Quality Assurance Project Plan.* June 2000.

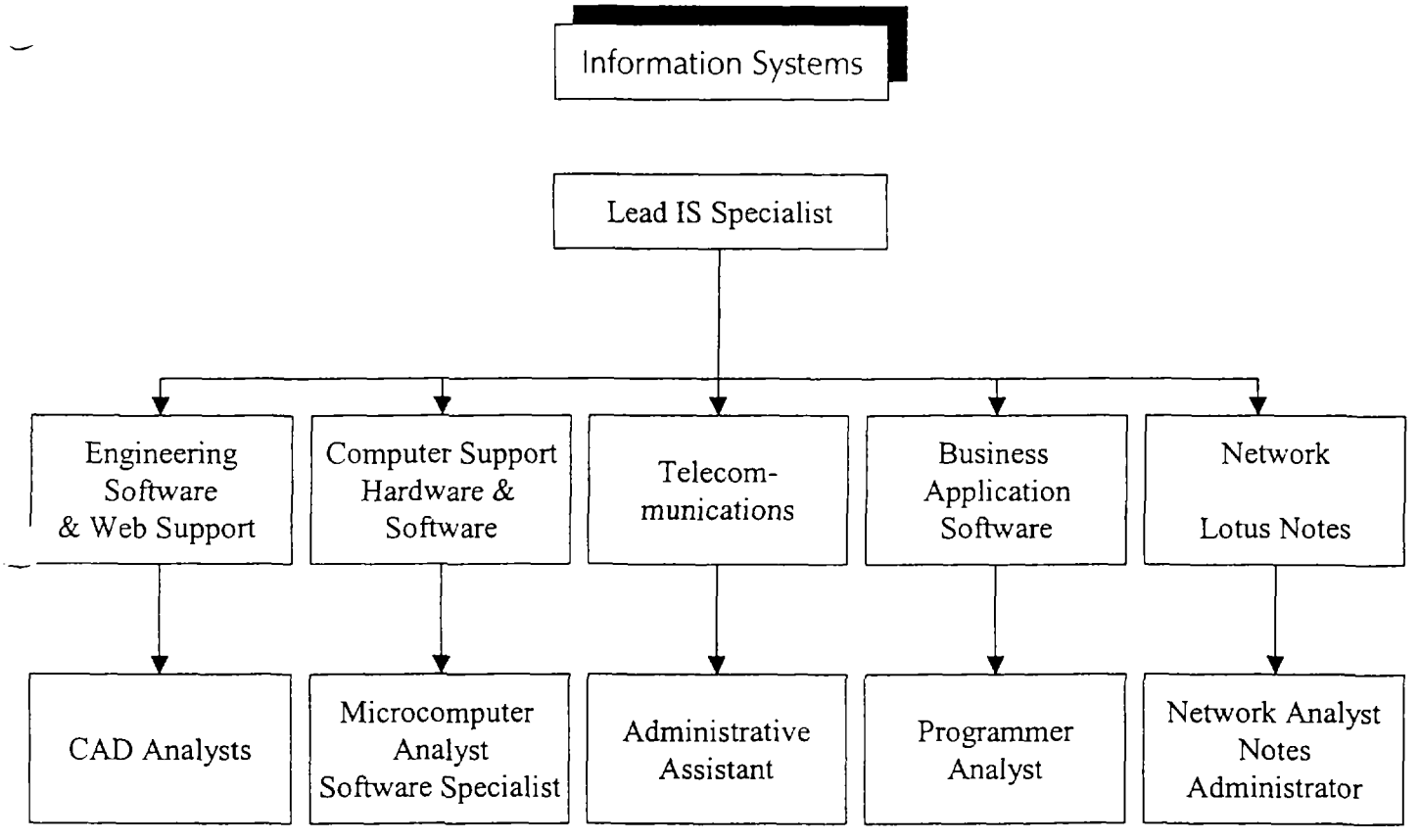
USEPA, 2001a. *EPA Requirements for Quality Assurance Project Plans for Environmental Data Operation (QA/R-5).* March 2001.

USEPA, 2001b. *EPA Requirements for Quality Management Plan (QA/R-2).* March, 2001.

Appendix A

Information Systems Group
Organization and Responsibilities

Information System
Organization Chart



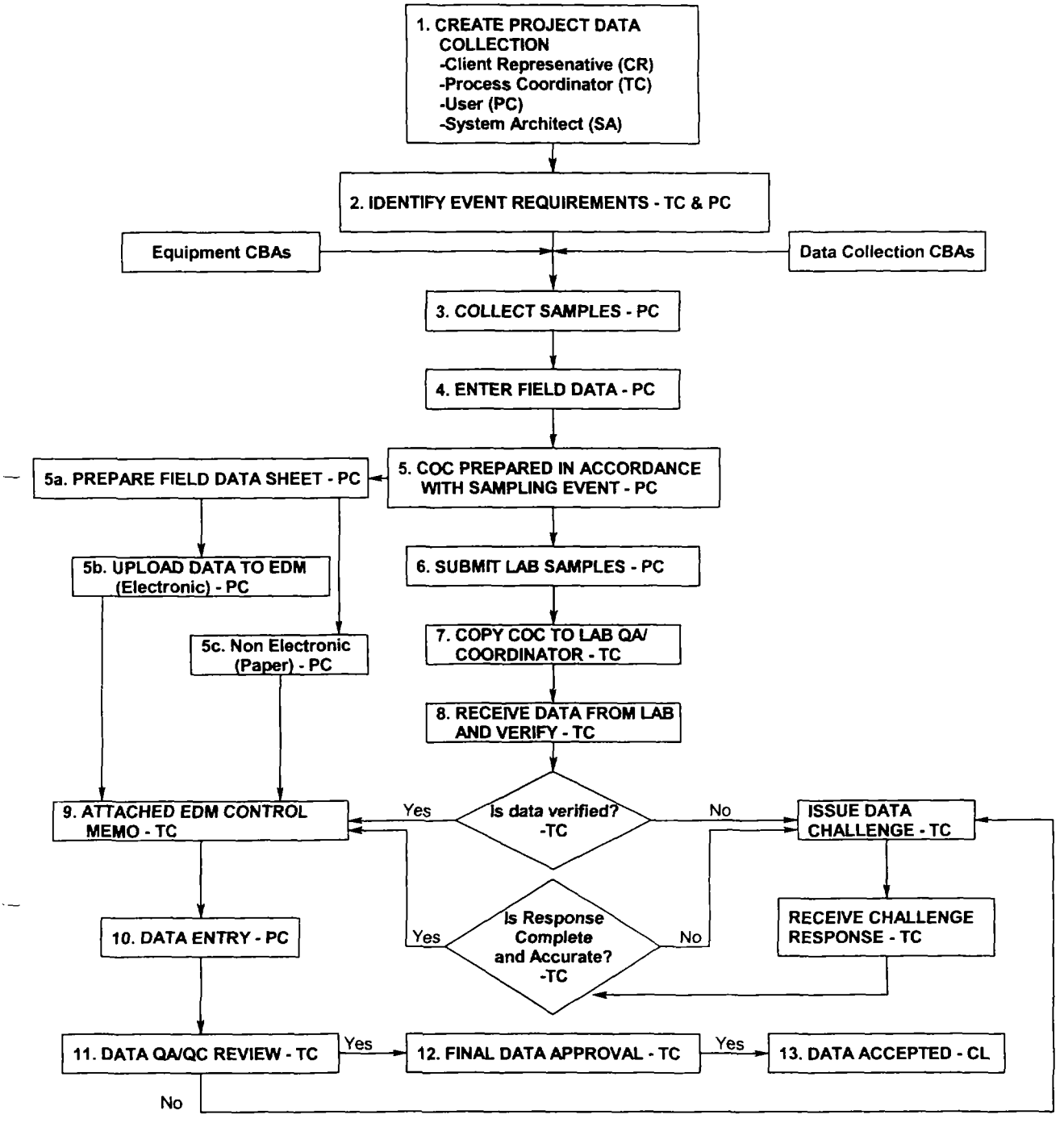
Information Systems
Roles and Responsibilities
November 2002

Position	Technical Area	Position Responsibilities
Administrative Assistant	Telecommunications	•Telephone Systems Administration & Support •Phone billing •Access Codes •Pagers •Cellular phones
Programmer Analyst	Business Application Support	•End User Support •Lawson Software •PMIS Programming •AS400 Operations
CAD Analyst	Engineering Software - AutoCAD Web Support	•End User Support •Troubleshooting •Standards •Plotting Support •Internet/Intranet
CAD Analyst	Engineering Software - Microstation	•End User Support •Troubleshooting •Customization •Plotting Support •Internet Administration
Software Specialist	Desktop Software	•End User Support •Troubleshooting •Corporate Standards & Templates •Computer Software Training
Microcomputer Analyst	Hardware Administration	•End User Support •Corporate Standards •System Installation •Purchasing/Hardware Configuration •Printers/Printing Support
Notes Administrator	Lotus Notes	•Lotus Notes System Administration - End User Accounts - Training •CPAS Support •PDA Support
Network Analyst	Network Administration	•NT System Administration - End User Accounts - Network Printers/Printing - LAN/WAN Server Administration •Remote Access (RAS) •Backups/Restores/Archive
Lead IS Specialist	All	•Project Management •Resource Coordinator •Level 2 Problem Resolution

Appendix B

EDM Process

Foth & Van Dyke
EDM Process



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Appendix C

Annotated Check List for Reviewing EPA Quality Management Plans

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, DC 20460

December 30, 1999

OFFICE OF
ENVIRONMENTAL INFORMATION

MEMORANDUM

SUBJECT: Checklist for Reviewing EPA Quality Management Plans

FROM: Nancy W. Wentworth, Director */s/Nancy W. Wentworth*
Quality Staff (2811R)

TO: EPA QA Managers

Attached is the Quality Management Plan (QMP) Checklist (Attachment 1) that the Quality Staff is using in its review of QMPs submitted for Agency approval by your organizations. I urge you to use this checklist to ensure that your organization's QMP is complete before it is submitted for approval and to attach the completed checklist to your submission.

This checklist was developed solely for the Quality Staff to use in reviewing Agency QMPs. However, you may use it to review QMPs submitted to your organization. If so, you will need to remove any requirements specific to EPA (see Attachment 2) and tailor the checklist to emphasize those elements important to your organization and the proposed work. Also, note that the checklist assumes a familiarity with EPA requirements.

This checklist was circulated for review in March 1999 and comments have been incorporated. Where applicable, comments were also incorporated into the document, *EPA Requirements for Quality Management Plans (QA/R-2)*. The checklist is consistent with both this document and Chapter 3 of EPA Manual 5360 (July 1998). The revised "Requirements" document will be finalized pending an announcement in the Federal Register by EPA's Office of Acquisition Management.

If you have any questions, please call me at (202) 564-6830. If you have specific questions about how your comments were addressed, contact Pat Lafornara at (732) 906-6988.

Attachments

CHECKLIST FOR REVIEWING EPA QUALITY MANAGEMENT PLANS

This checklist will be used to review the Quality Management Plans (QMPs) that are submitted to the Quality Staff of the Office of Environmental Information (OEI) for Agency review under EPA Order 5360.1 A2. Items from this checklist are discussed in detail in Chapter 3 of EPA Manual 5360 A1 and in *EPA Requirements for Quality Management Plans (QA/R-2)*. Consult these resources for more information on the items below.

Note that all items below must be included in a QMP. If an item is not relevant, an explanation must be provided. Also note that process may either be described or referenced in the QMP; however, all references should be readily accessible within the organization and provided to the Quality Staff with the QMP.

	Page(s)	Comments
MANAGEMENT AND ORGANIZATION		
1. Signed and dated by senior manager?	Title Page	S. Donohue, Project Manager
2. Signed and dated by senior line management?	"	S. Laszewski, Project Director/Assoc.
3. Signed and dated QA manager?	"	J. Kesy
4. Includes signature lines for Quality Staff approval?	NA	Not required for non-EPA organization
5. Includes signature lines for OEI approval?	Title Page	S. Hansen, Remedial Project Manager
6. Includes statement of the organization's QA policy?	Sec.3.1 pg 3	
6a. QA policy statement includes general objectives/goals?	"	
6b. QA policy statement includes allocation of intramural, extramural, and travel funds and personnel?	NA	Not applicable for non-EPA organization

	Page(s)	Comments
7. Includes organizational chart?	Fig.3-1	
7a. Organizational chart identifies all components of organization?	"	
7b. Organizational Chart identifies position of QA manager?	"	
7c. Organizational Chart identifies lines of reporting of the QA manager?	"	
7d. Organization Chart identifies any other QA staff?	"	
8. Includes discussion of authorities of the QA manager and staff?	"	
9. Documents the independence of QA manager?	Sec.3.2 & 4.4.1 pg 7-8	
10. Describes procedures to ensure QA staff have access to appropriate levels of management?	Sec.3.2	
11. Discusses technical activities or programs that require quality management?	Sec. 3.2	
12. Discusses where oversight of delegated or extramural programs is needed?	Sec. 3.2	

	Page(s)	Comments
13. Identifies where internal coordination of QA and QC activities among organizations is needed?	Sec. 3.2	
14. Discusses how management assures understanding and implementation in all programs?	Sec. 3.2	
15. Describes process for resolving disputes?	(NA)	Not applicable for non-EPA organizations
QUALITY SYSTEM COMPONENTS		
16. Includes description of quality system?	Sec. 4	
17. Describes principal quality system components (e.g., quality system documentation, annual reviews and planning, project-specific quality documentation? (Note, identify components in Column 3.)	Sec. 4.1	CBAs, PMS, TMS, PPD, etc.
18. Description of components includes how they are implemented?	Sec. 4.1 thru 4.10	
19. Description of components includes responsibilities of management and staff?	Sec. 4.1 thru 4.7	
20. Lists tools for implementing each component (e.g., QMPs, Quality Systems Audits, Training Plans, QA Project Plans? (Note: list tools in Column 3.)	Sec. 4.8 + 4.9 Sec. 11.1	through 11.3

	Page(s)	Comments
21. Identifies internal organizations that develop QMPs?	Sec. 4.4.1	
22. Identifies review and approval procedures for these internal QMPs?	Sec. 4.4.2	
23. Includes assurance that QA responsibility is incorporated into performance standards (consistent with Agency personnel policy)?	NA	Not required for non-EPA organizations
QUALIFICATIONS AND TRAINING		
24. States policy regarding QA training for management and staff?	Sec. 5	
25. Describes process for identifying, ensuring, and documenting that personnel have necessary quality-related qualifications?	Sec.5.1 & 5.2	
26. Describes process for ensuring personnel maintain quality-related qualifications?	Sec. 5.1 - 4.7	
27. Describes process for identifying the need for quality-related retraining based on changing requirements?	Sec. 5.9	
28. Includes roles, responsibilities, and authorities in description of above processes?	Sec. 5.7 - 5.9	

	Page(s)	Comments
PROCUREMENT OF ITEMS AND SERVICES		
29. Describes process for reviewing and approving all extramural agreements (grants, cooperative agreements and contracts)?	Sec. 6	
29a. Review process ensures documents are complete and accurate?	Sec. 6	
29b. Review process ensures agreement clearly describes the item or service needed?	Sec. 6	
29c. Review process ensures agreement describes the associated technical and quality requirements?	Sec. 6	
29d. Review process ensures agreement describes the quality system elements for which the supplier is responsible?	Sec. 6	
29e. Review process ensures that the supplier's conformance to the customer's requirements will be verified?	Sec. 6	
30. Describes process for reviewing and approving applicable responses to solicitations to ensure that they satisfy all technical and quality requirements?	Sec. 6	
30a. Review process ensures the review of evidence of the supplier's capability to satisfy EPA quality requirements?	NA	Not applicable for non-EPA organizations
30b. Review process ensures procured items and services are acceptable?	Sec. 6	
31. Describes process for review and approval of suppliers' quality-related documentation (e.g., QA Project Plans and QMPs)?	NA	Not applicable for non-EPA organizations

	Page(s)	Comments
32. Includes discussion of any policy and criteria for delegations of review of QA Project Plans and QMPs?	NA	Not applicable for non-EPA organizations
33. Describes process to ensure EPA extramural agreement policies satisfied?	NA	Not applicable for non-EPA organizations
34. Includes roles, responsibilities, and authorities in description of above processes?	Sec. 6	
DOCUMENTS AND RECORDS		
35. Describes process for identifying quality-related documents and records (including electronic) requiring control?	Sec. 7	
36. Describes process for preparing, reviewing, approving, issuing, using, authenticating, and revising documents and records?	Sec. 7	
37. Describes process for ensuring that records and documents accurately reflect completed work?	Sec. 7	
38. Describes process for maintaining documents and records including transmittal, distribution, retention, access, preservation, traceability, retrieval, removal of obsolete documentation, and disposition?	Sec. 7	
39. Describes process for establishing and implementing appropriate chain of custody and confidentiality procedures for evidentiary records?	Sec. 7.1	

	Page(s)	Comments
40. Above processes comply with EPA Order 2160 and EPA Directive 2100, Chapter 10?	NA	Not applicable for non-EPA organizations
41. Includes roles, responsibilities, and authorities in description of above processes?	NA	Not applicable for non-EPA organizations
COMPUTER HARDWARE AND SOFTWARE		
42. Describes process for developing, installing, testing, using, maintaining, controlling, and documenting computer hardware and software?	Sec 8.3.1 - 8.3.3.	
43. Describes process for assessing and documenting the impact of changes to user requirements and/or the hardware and software on performance?	Sec 8.3.1 - 8.3.3	
44. Describes process for evaluating purchased hardware and software?	Sec 8.3.1 - 8.3.3	
45. Describes process for ensuring that data and information produced from or collected by computers meet applicable requirements and standards?	Sec 8.3.6	
46. Includes roles, responsibilities, and authorities in description of above processes?	Sec. 8 Appendix A&B	
47. Are the requirements of EPA Directive 2100 are addressed in the above processes?	NA	Applies to EPA internal records management

	Page(s)	Comments
PLANNING		
48. Includes a description of the systematic planning process for environmental data operations?	Sec 9.2	See also QAPP and FSP
48a. Does process include identification and involvement of all customers and suppliers?	Sec 9.2	See also QAPP and FSP
48b. Does process include description of the project goal, objectives, and questions and issues to be addressed?	Sec.9.2	See also QAPP and FSP
48c. Does process include identification of project schedule, resources, milestones, and any applicable requirements?	Sec 9.2	See also QAPP and FSP
48d. Does process include identification of the type and quantity of data needed and how the data will be used to support the project's objectives?	Sec 9.2	See also QAPP and FSP
48e. Does process include specification of performance criteria for measuring quality?	Sec 9.2	See also QAPP and FSP
48f. Does process include specification of needed QA and QC activities to assess the quality performance criteria?	Sec 9.2	See also QAPP and FSP
48g. Does process include description of how, when, and where the data will be obtained (including existing data) and identification of any constraints on data collection?	Sec 9.2	See also QAPP and FSP
48h. Does process include description of how the acquired data will be analyzed, evaluated, and assessed against its intended use and the quality performance criteria?	Sec 9.2	See also QAPP and FSP

	Page(s)	Comments
49. Describes process for developing, reviewing, approving, implementing, and revising QA Project Plans?	Sec 9.3	
50. Describes process for evaluating and qualifying data collected for other purposes or from other sources?	Sec 9.3	
51. Includes roles, responsibilities, and authorities in description of above processes?	Sec 9.3	
IMPLEMENTATION OF WORK PROCESSES		
52. Describes process for ensuring that work is performed according to planning and technical documents?	Sec 10	
53. Describes process for identifying operations needing procedures?	Sec 10	
54. Describes process for preparation, review, approval, revision, and withdrawal of these procedures?	Sec 10	
55. Describes policy for use of these procedures?	Sec 10	
56. Describes process for controlling and documenting the release, change, and use of planned procedures?	Sec 10	

	Page(s)	Comments
56a. Process includes description of necessary approvals?	Sec 10	
56b. Process includes removal of obsolete documentation from work areas?	Sec 10	
56c. Process includes verification that the changes are made as prescribed?	Sec 10	
57. Includes roles, responsibilities, and authorities in description of above process?	Sec 10	
ASSESSMENT AND RESPONSE		
58. Describes the process for assessing the adequacy of the quality system at least annually?	Sec 11.1 - 11.3	
59. Describes the process for planning, implementing and documenting assessments and reporting results to management?	Sec 11.1 - 11.5	
59a. Process includes selecting an assessment tool, the expected frequency, and the roles and responsibilities of assessors?	Sec 11.1 - 11.5	
59b. Process includes determining the level of competence, experience and training needed for assessment personnel?	Sec 11.1 - 11.5	
59c. Process includes ensuring that personnel have no real or perceived conflict of interest, and have no direct involvement or responsibility for the work being assessed?	Sec 11.1 - 11.5	

	Page(s)	Comments
59d. Process includes ensuring that personnel conducting assessments have sufficient authority, access to programs and managers, access to documents and records, and organizational freedom?	Sec 11.1 - 11.5	
60. Describes process for management's review of, and response to, findings?	Sec 11.5	
61. Describes process for identifying how and when corrective actions are to be taken in response to the findings of the assessment?	Sec 11.5	
61a. Process includes ensuring corrective actions are made promptly?	Sec 11	
61b. Process includes confirming the implementation and effectiveness of any corrective action?	"	
61c. Process includes documenting actions?	"	
62. Describes process for addressing disputes encountered as a result of assessments?	Sec 11.4	
63. Includes roles, responsibilities, and authorities in description of above processes?	Sec 11	

	Page(s)	Comments
QUALITY IMPROVEMENT		
64. Describes process for ensuring that conditions adverse to quality are prevented, identified promptly, corrected promptly and that actions are taken toward prevention, documented and actions tracked to closure?	Sec 12 & Sec 4.2.4.3 and 11	
65. Describes process for encouraging staff to establish communications between customers and suppliers, identify process improvement opportunities, and identify and propose solutions for problems?	"	
66. Includes roles, responsibilities, and authorities in description of above processes?	Sec 12 & Sec 4+11	
OTHER REVIEW CRITERIA		
67. Are regulatory or other citations accurate?	Sec 13	Updated per the Internet
68. Are there any inconsistencies in the text?		
69. Is the writing clear?		
70. Are organizational units identified consistent with the most recent reorganization?		
71. Are past QS management assessment findings resolved? (Put date of Final Report in Column 3.)		

	Page(s)	Comments
72. Are activities described in the QMP consistent with QA Annual Report and Work Plans?		
73. Are tasks proposed for other organizations not covered solely by this QMP documented elsewhere (e.g., in another organization's QMP)?		

ATTACHMENT 2
EPA-SPECIFIC QUALITY MANAGEMENT PLAN REQUIREMENTS

The following items from the *Checklist for Reviewing EPA Quality Management Plans* are only applicable for EPA QMPs required under EPA Order 5360.1 CHG 1 (July 1998):

4. Signature line for Quality Staff
5. Signature lines for OEI approval[1]
15. Dispute resolution process
23. Performance standards
30a. Review and approval of responses to solicitations to ensure they satisfy EPA quality requirements
31. Review and approval of quality-related documentation from suppliers
32. Policy and criteria for delegating approval of quality-related documentation
33. Process to ensure EPA contracting policies satisfied
40. Conformance to EPA Order 2160 and EPA Directive 2100, Chapter 10

[1]For non-EPA organizations, if EPA approval of a QMP is required, the approval page must include a section for the signature of the responsible EPA official.