Quality Control Plan

Risk Assessment and Direct Push Investigation
Red Water Ponds Areas, Former Plum Brook Ordnance Works
Sandusky, Ohio

Prepared By:

IT Corporation
312 Directors Drive
Knoxville, Tennessee 37923

Submitted To:

Commander
U.S. Army Engineer District, Nashville
Post Office Box 1070
Nashville, Tennessee 37202-1070

Revision 1

Delivery Order 031
Contract Number DACA62-94-D-0030
IT Project Number 773701

January 8, 1998

SIGNATURE PAGE

Quality Control Plan
Risk Assessment and Direct Push Investigation
Red Water Ponds Areas, Plum Brook Ordnance Works
Sandusky, Ohio

Delivery Order 031
Contract Number DACA62-94-D-0030
IT Project Number 773701

Submitted By:

Donn C Burton — 1/8/98

Don C. Burton, P.E.
Program Manager
IT Corporation

Date

Accepted By:

Linda S. Ingram — 20 JAN 1998

Linda Ingram
Technical Manager, Technical Management Section
U.S. Army Engineer District, Nashville

Date

for Philip T. McGee — 23 Jan 1998

John W. Hall
Chief, Technical Management Section
U.S. Army Engineer District, Nashville

Date

Quality Control Plan
Risk Assessment and Direct Push Investigation, Red Water Ponds Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

January 8, 1998

PROJECT OBJECTIVE AND TASKS

This Quality Control Plan (QCP) has been prepared in support of the Risk Assessment and Direct Push Investigation of the Red Water Ponds Areas at the former Plum Brook Ordnance Works (PBOW) in Sandusky, Ohio, under Delivery Order (DO) 031 of IDT Contract DACA62-94-D-0030. The purpose of DO 031 is to conduct the direct push investigation and risk assessments of the former Red Water Ponds Areas to evaluate the following Project Decision (PD) Statements:

- Determine the nature and extent of source areas
- Define current and future routes of exposure
- Characterize risk to current and future exposed human/biotic populations
- Determine acceptable Risk-Based Cleanup Levels
- Determine ARARs.

These PD Statements will be evaluated using direct push sampling at the two Red Water Ponds Areas at PBOW and through the completion of human health and ecological risk assessments. Specific objectives of this investigation are to (1) delineate the vertical and lateral extent of overburden contamination at the Red Water Ponds Areas in anticipation of a future remedial action, and (2) to collect data for use in fate and transport modeling of the Red Water Ponds Areas. Specific tasks to be accomplished under this project include:

Task 1: **Preparation and Submittal of Quality Control Plan (QCP).** IT will prepare and submit a Quality Control Plan (QCP) for the work to be conducted at PBOW. The QCP will be prepared in accordance with the requirements of ER 1110-1-12, *Quality Management*, and CEORD 1110-1-9, *Quality Control*. A verification statement will be included with all products submitted to the Government under this SOW. The statement will be signed by the independent reviewers identified in the QCP, stating that they have reviewed the applicable document or product and that all internal

comments have been resolved, thus completing the product for release to the Government. All comments generated by reviewers of a product or document, along with their resolution, will be submitted with the verification statement.

Task 2: **Preparation and Submittal of Site-Specific Addenda to the SHP and SAP.** IT Corporation will prepare a SSHP for this work as an addendum to the PBOW Site-Wide Safety and Health Plan (SHP) of the *Site Investigations and Groundwater Investigations Work Plans* (IT, September 1996). The SSHP will be prepared under the supervision of a CIH, and will comply with the following requirements, as a minimum:

- Federal Acquisition Regulations (FAR), Clause 52.236-13, *Accident Prevention.*
- U.S. Army Corps of Engineers (AE), *Safety and Health Requirements Manual*, EM 385-1-1, October 1992.
- Occupational Safety and Health Administration (OSHA) *Construction Industry Standards*, 29 CFR 1926; and *General Industry Standards*, 29 CFR 1910; with particular emphasis on 29 CFR 1910.120, *Hazardous Waste Site Operations and Emergency Response*.
- NIOSH / OSHA / USCG / EPA, *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, October 1985.
- USACE *Safety and Occupational Health Document Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) Activities*, Appendix B, ER 385-1-92.
- USACE Contractor Guidelines for (1) *The Preparation of the Accident Prevention Proposal* (Safety Plan), and (2) *The Preparation of the Activity Hazard Analysis*, ORNP 385-1-2, May 1986.
- Nuclear Regulatory Commission Standards (10 CFR 19 – 171).
- Other applicable federal, state, and local safety and health requirements.

The SSHP Addenda required by 29 CFR 1910.120(b)(4), 29 CFR 1926.65(b)(4) and as defined by the SOW will describe the health and safety procedures, practices, and equipment to be implemented and utilized to protect affected personnel from the potential hazards associated with the site-specific tasks to be performed. The level of detail provided in the addenda will be tailored to the type of work, complexity of operations to be accomplished, and hazards anticipated.

IT Corporation will also prepare a SSAP for this work as an addendum to the PBOW

Site-Wide Sampling and Analysis Plan (SAP) of the *Site Investigations and Groundwater Investigations Work Plans* (IT, September 1996). The SSAP will be compatible with previously approved SSAPs and in accordance with the SAP, EM 200-1-3, EM 1110-1-4000, and ER 1100-1-263.

The SSHP and SSAP will be submitted to the USACE and Ohio EPA for review and approval prior to commencement of any field work. All work will be performed according to the approved plans. Review comments received on the draft SSHP and SSAP will be addressed and incorporated into the final documents. Responses to the technical review comments will be included with the submittal of the final document.

Task 3: **Direct Push Borings.** A kickoff and coordination meeting will be held at the PBOW site prior to beginning field activities associated with this investigation. IT will present details of the investigation for discussion and coordination, including digging permits and utility clearances, with CELRN and NASA PBS representatives.

A total of 40 direct push borings for chemical analysis will be advanced and sampled during the investigation. One surficial soil sample (0 - 12 inches) will be collected from each of the borings. Additionally, two subsurface soil samples will be collected at depth intervals to be determined in the field; depth intervals of 4 to 5 feet and 9 to 10 feet are assumed for each boring. One groundwater sample will also be collected from each of the forty (40) direct push locations; it is assumed that the groundwater sample will be collected at the total depth of 10 feet (bedrock interface). QA/QC samples will be collected as required by the SAP, QAPP, and SSAP. Upon completion of sample collection, each borehole will be abandoned by grouting to the surface.

Ten additional direct push boreholes will be advanced for the purpose of collecting geotechnical samples. As with the direct push locations for chemical sampling, geotechnical locations will be advanced to the top of rock (assumed to be 10 feet bgs) and three soil samples will be collected from each borehole at depth intervals to be determined in the field; groundwater samples will NOT be collected from the geotechnical sample locations.

It is anticipated that some of the direct push boreholes will not initially produce a sufficient amount of groundwater for sample collection. Therefore, temporary well screens and casings will be installed in up to twenty (20) of the direct push boreholes, and will be permitted to stand until a sufficient quantity of water has accumulated for sample collection. The temporary piezometers will not be developed or purged prior to groundwater sampling. Following the completion of groundwater sampling from these temporary piezometers, the PVC casing and screen will be removed and the borehole abandoned.

A qualified geologist will be on-site for all drilling and soil sampling activities. Soil materials will be sampled continuously in all borings. In addition to the information required by EM 200-1-3, the geologist will visually classify and log borehole materials according to the USCS, EM 1110-1-4000, and CELRN's *HTRW Design Branch Logging Manual*. Direct push borings will be logged in the field using ENG Form 5056-R and 5056A-R.

Following completion of direct push sampling activities, IT will secure the services of an Ohio registered Professional Land Surveyor (PLS) to determine the coordinates and elevations of new direct push locations. The horizontal coordinates shall be to the closest 0.1 foot and referenced to the State Plane Coordinate System (SPCS). Vertical coordinates (ground elevation and well riser) will be to the nearest 0.01 foot and referenced to the 1929 National Geodetic Vertical Datum (NGVD). All survey data will be tabulated. Loop closure for survey accuracy shall be within the horizontal and vertical limits given above.

Task 4: **Analytical Requirements.** IT will manage all analytical data beginning at the point of sampling, continuing through laboratory analysis, data reporting, data evaluation, and culminating with the required electronic data submittal. Under this task, samples will be packaged and shipped from field, submitted for analysis, and tracked through the laboratory system. Reported data will be reviewed, validated as required, and entered into an Oracle database for use by IT technical staff in the preparation and submittal of required reports, statistical analyses, and electronic data submittals.

Quality Assurance Sample Collection and Analysis. IT will coordinate, collect, package, and ship the required frequency (5%) of QA samples to the QA laboratory specified in the SOW for this effort. The U.S. Army Corps of Engineers, Northwest Division Laboratory has been identified as the QA laboratory. Field split samples will be collected at the frequency specified and submitted to:

U.S. Army Corps of Engineers, Northwest Division Laboratory
CENWO-LB, ATTN: Mr. Douglas Taggart
420 South 18th Street
Omaha, Nebraska 68102-2586

Analytical Data Review, Reporting, and Assessment Requirements. Data will be extensively reviewed by the laboratory in accordance with the three-level process specified in EM 200-1-3. Documentation of this review will be included in the data package(s) submitted. A systematic technical review and validation will be performed for all environmental samples and field duplicates to ensure data quality and overall accuracy. The extent of the review and validation will be comparable to a Level III data validation. The Functional Guidelines for Organic and Inorganic Review (February 1993 and 1994) will be followed in the evaluation as well as the

submitted laboratory SOPs and the guidance and project limits presented in the SSAP.

As a component of the field module of the Oracle database, samples will be logged with all associated field QC samples, including duplicates, splits, field blanks, and trip blanks, as required. The information will be forwarded in hardcopy and electronically to the Northwest Division Laboratory as well as to CELRN for their use in data evaluation and preparation of the Chemical Quality Assurance Report. All sample planning, collection, and tracking information will be maintained in the field module. This information will then be down-loaded to the Oracle database to act as a template and basis of comparison for the analytical data to be received.

Task 5: **Investigation Derived Waste.** Investigation derived wastes (IDW) to be generated during this project may include soil cuttings from direct push locations, PPE, purge water, and decontamination water. Soil cuttings from direct push borings will be returned to the borehole following sample collection. PPE will be double bagged and placed in an on-site industrial dumpster for disposal at an industrial landfill. Aqueous IDW will be placed in 55-gallon drums and stored at the site for later disposal. It is assumed that aqueous wastes may be disposed of on-site by pouring the drum contents on the ground in an area of known contamination.

Task 6: **Geographic Information System Deliverable.** IT will develop a database of collected geologic and chemical information for this investigation. This database will include information related to the boring locations, surveyed coordinates and elevations, and chemical (analytical) data. The deliverable package will be formatted as specified in the *Data Standard for Corps of Engineers Environmental Restoration Sites* and the *Tri-Service Spatial Data Standards* (TSSDS).

Task 7: **Human Health and Ecological Risk Assessment.** IT will complete a risk assessment for the Red Water Ponds Areas in accordance with the requirements of *Risk Assessment Guidance for Superfund*, Volume I (EPA/540/1-89-002), Human Health, and subsequent guidance, and Volume II (Ecological Assessment) (EM 200-1-4); *Ecological Risk Assessment Guidance for Superfund* (EPA/540/R-97-006); *Tri-Services Procedural Guidelines for Ecological Risk Assessment*; and *USEPA 5, Biological Technical Assistance Group Ecological Risk Assessment Bulletin #1, Development and Use of Ecotox Thresholds*. In addition, the risk assessment will comply with the requirements of the Ohio Environmental Protection Agency (OEPA), the USEPA, Region 5 (see below), and the USACE *Risk Assessment Handbook.*

Human Health Risk Assessment. The human health risk assessment (HHRA) will be performed for the Red Water Ponds Areas in support of the Defense Environmental Restoration Program (DERP). Under DERP, the responsibility for regulatory oversight resides with the state in which the facility is located, rather than

with the regional office of the EPA. The PBOW is located in the State of Ohio (EPA Region V), and the Ohio Environmental Protection Agency (OEPA) will provide regulatory oversight. Therefore, OEPA risk assessment guidance will be followed during the risk assessment process. OEPA risk assessments generally follow the form and methodology prescribed by the U.S. EPA Risk Assessment Guidance for Superfund series, mentioned above, with some minor modifications.

Ecological Risk Assessment. IT will complete a Tier 1 Ecological Risk Assessment as specified in the SOW. Specific components of the ecological risk assessment task to be completed include the Ecological Risk Assessment Work Plan; Problem Formulation, including Ecological Site Description, Site Reconnaissance (Biota Checklist), Documentation of Potential Receptors of Special Concern and Critical Habitat, Significant Ecological Threats, Selection of Preliminary Chemicals of Ecological Concern, Selection of Key Receptors, Ecological Endpoint (Assessment and Measurement) Identification, and Ecological Site Conceptual Model (ESCM); Exposure Characterization; and Risk Characterization.

Risk Summary, Risk Management Recommendations, and Identification of Preliminary Remedial Action Objectives. IT will summarize both human health and ecological risk associated with releases from the Red Water Ponds Areas based upon results of the Human Health and Ecological Risk Assessments. This will include development of recommendations for managing risk or for further risk investigations and development of site-specific RAOs for the Red Water Ponds Areas.

Task 8: **Meetings.** IT will attend two meetings to discuss the human health and ecological risk assessments; one meeting will be held at the USACE offices in Nashville, Tennessee, and one meeting will be held at the PBS offices in Sandusky, Ohio.

Task 9: **Preparation and Submittal of Report of Findings.** IT will prepare a single Report of Findings to discuss the findings of this delivery order. The report will be site-specific for the Red Water Ponds Areas, but will include all items necessary to clearly and concisely convey the estimation of risk to the reader. In addition, the report will identify site-specific ARARs and cleanup levels (as deemed necessary). IT will respond, in writing, to all comments received on the draft report, incorporate changes resulting from the review comments, and issue a final report. Each of the report versions will be submitted to the USACE Nashville District Technical Manager for distribution (fifteen copies of the draft report and twenty copies of the final report).

KEY IT PROJECT PERSONNEL

- **Program Manager** - Mr. Don C. Burton, P.E., will serve as the Program Manager.
- **Project Manager** - Mr. Mikael L. Spangberg, will serve as IT's Project Manager.

- **Principal Investigator** - Mr. Steven Muffler, R.P.G., will serve as the Principal Investigator.
- **QA Manager** - Mr. Tony Smith, will serve as the QA Manager.
- **HSO Officer** - Ms. Melissa G. Smith, CIH, will serve as IT's HSO Officer.
- **Project QC Officer** - Ms. Kim Arrant will serve as Project QC Officer.

QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) REVIEW

This section of the QCP summarizes the IT internal technical and external peer review. The IT QA program provides controls for the formal verification (checking) of documents such as calculations and the presentation of information in the form of drawings, logs, and tables. Review and necessary approvals are also cited for quality-related documents; however, during the course of a project or proposal, verification of technical decisions and concepts (such as interpretation of data and evaluation of results) is required in order that the project or proposal can proceed on a sound conceptual basis. The review concept, or approach, may be needed to address the following general questions during project execution:

- During the project planning stage, have appropriate steps been implemented to satisfy the goals and objectives of the project?
- Are data of sufficient quality and properly interpreted so that conclusions can be justified and demonstrated?
- Are design parameters reasonable for the computations performed? What is the effect of variations of the assumptions upon the results?
- Do the results presented by IT in the form of a report, or other document, adequately represent the work performed and the conclusions reached? Do the results fulfill the objectives of the project?

The internal technical review process is used to verify these steps. Documents to be written during a project and indicated in the proposal will be subjected to an internal review process consisting of technical and peer reviews. The IT PM will complete a matrix of these documents on a delivery order basis, receive the Program Manager's concurrence, and use it to obtain the required reviews. Technical reviewers are selected from the project team (Table 1), and will perform comprehensive "internal" or project reviews of all project documents to ensure that the above requirements have been satisfied. In addition, peer reviewers are selected to perform a

Table 1

Preparation and Review Process for Required Project Deliverables
Risk Assessment and Direct Push Investigation, Red Water Ponds Areas
Former Plum Brook Ordnance Works, Sandusky, Ohio

Submittal Description/ Title	Document Preparation and Review Process								
	Principal Author(s)	Grade	Discipline	Peer Review	Grade	Discipline	Project Review	Grade	Discipline
Site-Specific Sampling and Analysis Plan (SSAP)	George Yu Dennis Seymore Kimberly Arrant	E07 E06 E08	Hydrogeologist Geologist Chemist	Belinda Price	E12	Hydrogeologist	Mikael Spangberg Tony Smith Steve Muffler	E11 E08 E08	Engineer QA Officer Geologist
Ecological Risk Assessment Work Plan	Greg Sylwester	E05	Ecologist	Robin Zimmer	E12	Ecologist/Risk Assessor	Mikael Spangberg Tony Smith Steve Muffler	E11 E08 E08	Engineer QA Officer Geologist
Site-Specific Safety and Health Plan (SSHP)	Melissa Smith James Bolden	E10 E10	H&S Professional H&S Professional	Harry Pullum	E13	Indus. Hygienist	Mikael Spangberg Tony Smith Steve Muffler	E11 E08 E08	Engineer QA Officer Geologist
Report of Findings (Draft and Final)	George Yu Dennis Seymore Kimberly Arrant Adrian Gonzalez Greg Sylwester	E07 E06 E08 E05 E05	Hydrogeologist Geologist Chemist Risk Assessor Ecologist	Belinda Price Paul Goetchius Robin Zimmer	E12 E10 E12	Hydrogeologist Risk Assessor Ecologist/Risk Assessor	Mikael Spangberg Tony Smith Steve Muffler	E11 E08 E08	Engineer QA Officer Geologist

comprehensive "outside" review of the documents. A peer reviewer is selected based upon the following criteria:

- The reviewer must be independent of the project. The reviewer must be sufficiently informed regarding the project, but should not be making decisions which determine or affect the course of the project.

- The reviewer must be a person knowledgeable in the specific area of work, preferably a senior technical associate. Technical reviewers will be part of the IT organization.

At the conclusion of a technical (project) or peer review, the reviewer(s) will prepare written review comments, sign off on the Discipline Sign-Off Review form (Figure 1) and forward it to the Program Manager, PM, and QAO; a copy of these review documents will also be placed in the project files. Technical review comments will be responded to in writing by the preparer, incorporated into the document as appropriate, and submitted with the document to the USACE. Figure 2 is a data review flow chart for sample collection and field data collection activities.

External peer review will be performed on all draft project deliverables prior to issuance as final documents. It is anticipated that the external peer review will be performed, as a minimum, by the U.S. Army Corp of Engineers (USACE) and the Ohio Environmental Protection Agency (OEPA). A formal response to peer review comments will be issued to all reviewing parties, documenting revisions made where appropriate to the draft deliverables. All responses to the peer review comments will be coordinated with the USACE for their concurrence prior to incorporation. Final deliverables will be submitted after incorporating any pertinent comments that arise from peer review of the draft documents. Table 1 summarizes the preparation and review process for the required project deliverables.

FIELD ACTIVITY QA REQUIREMENTS

Field investigation activities will follow the procedures specified in the SSAP and SSHP to ensure that project quality requirements are satisfied. Field activity QA will be implemented by performing project-specific training; properly preparing for field work before mobilization; issuing variances, nonconformance reports, and corrective action reports; and documenting field quality control in the investigation reports.

INTERNATIONAL TECHNOLOGY CORPORATION

DISCIPLINE SIGN-OFF REVIEW

Client Name: U.S. Army Engineer District, Nashville; CELRN-EP-R-M

Project Description: Risk Assessment and Direct Push Investigation, Red Water Ponds Areas, Former Plum Brook Ordnance Works, Sandusky, Ohio

Contract Number: DACA62-94-D-0030 Delivery Order Number: 0031

Project Number: 773701 Task / Phase Number:

Document Type

- ☐ Technical / Cost Proposal
- ☐ RFP
- ☐ Contract / Subcontract
- ☐ SAP, SSAP, CDAP, or QAPP
- ☐ SHP or SSHP
- ☐ _____ Report
- ☐ Risk Assessment / Evaluation
- ☐ Specifications & Plans
- ☐ Design Calculations
- ☐ Tables
- ☐ Drawings / Figures
- ☐ Other: _____

Identify specific section or segment covered by this checkprint

Document Origin

- ☐ Originator Developed
- ☐ Edited Standard
- ☐ Client Furnished

Document Status

- ☐ Preliminary
- ☐ Internal Draft
- ☐ Draft
- ☐ Draft Final
- ☐ Final
- ☐ Other: _____

	Required Person	Signature	Date
Originator			
Checker			
Backchecker			
Updater			
Rechecker			
Technical Reviewer			
Technical Reviewer			
Technical Reviewer			
Technical Reviewer			
Quality Assurance Officer	T. Smith		
Project Manager	M. Spangberg		
Program Manager	D. Burton		

FIGURE 1

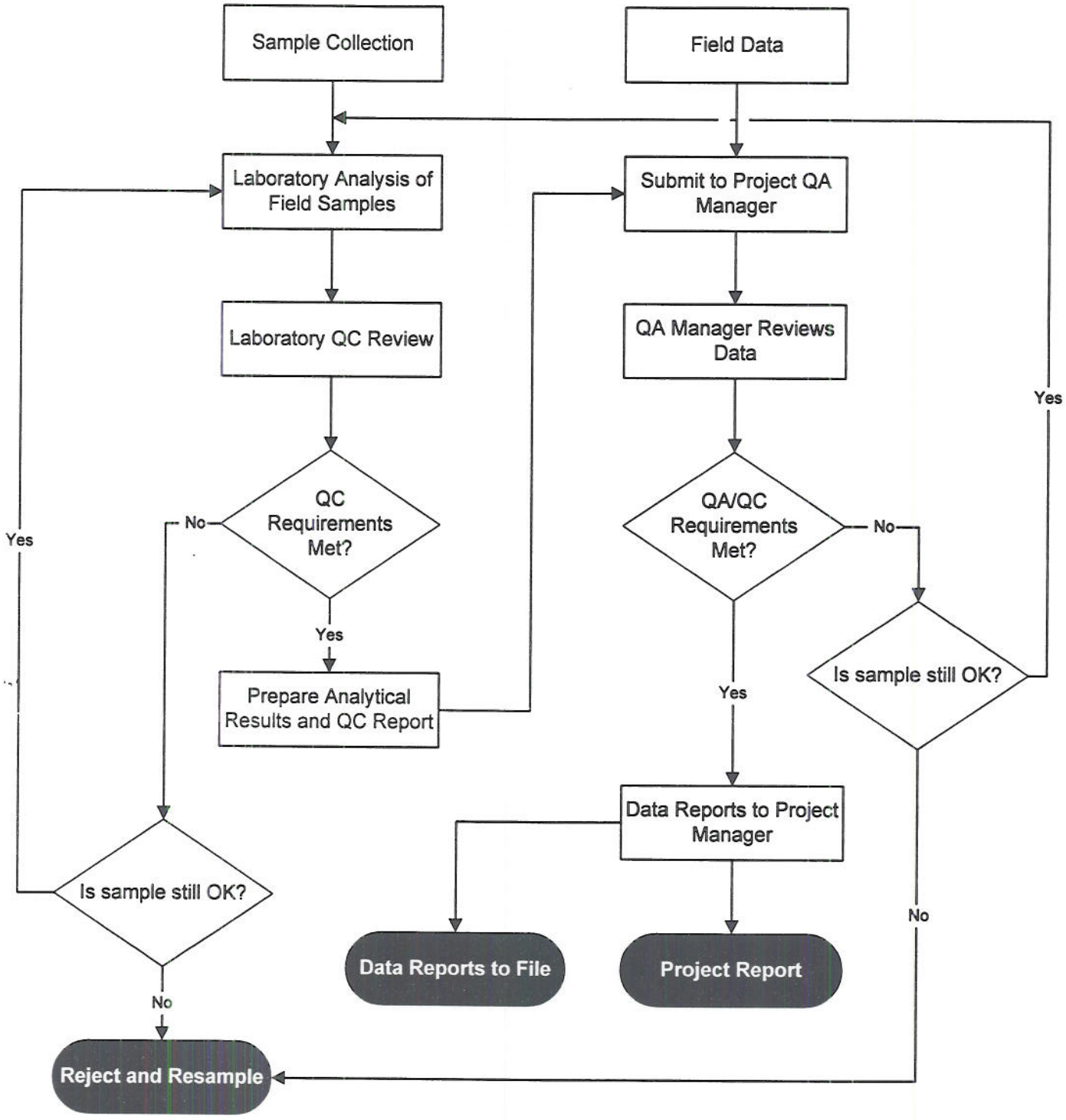

FIGURE 2

DATA REVIEW FLOW CHART

INTERNATIONAL TECHNOLOGY CORPORATION

RISK ASSESSMENT AND DIRECT PUSH INVESTIGATION
RED WATER PONDS AREAS
FORMER PLUM BROOK ORDNANCE WORKS

Field team members, including IT personnel and subcontractor personnel, will receive project-specific training before mobilization to the job site by reading the applicable work plans and procedures. Upon mobilization to the site, but prior to commencing field activities, all site personnel will attend the project kickoff meeting, which will consist of a review of all project requirements and objectives to ensure that the project team is fully aware of the goals of the PBOW investigation. Before initiating each days field work, all team members will participate in a tailgate safety meeting (TSM) conducted by the IT Field Coordinator to address safety and quality issues pertinent to the activities to be performed. The TSM will be documented and all personnel will sign the attendance record. Worker training will follow the requirements specified in IT Corporation SOPs.

Prior to mobilization to the site, the IT PM, assisted by the IT Field Coordinator and the IT Analytical Coordinator, will examine project field work preparation requirements to ensure that all necessary arrangements, including personnel assignments, work plans, site entry/drilling permits, training, schedule, equipment rentals, supplies, subcontractors, have been accomplished for execution of the field effort in an efficient and effective manner. The IT PM and QAO must approve the project preparation prior to mobilization.

Changes or variances to the SSHP, SSAP, SAP, SHP, or QAPP may be initiated either in the office or in the field as may be necessary. All variances will be noted on the Field Activity Daily Log (FADL) and will be formally recorded on the Variance Log. Variances will be approved by the IT QAO and the IT PM prior to implementation of the change. Variances that will affect the project scope, cost, or schedule will be submitted to the USACE for approval prior to implementation.

Nonconforming equipment, items, activities, conditions, and unusual incidents that could affect compliance with project requirements will be identified, controlled, and reported in a timely manner. A nonconformance is defined as a malfunction, failure, deficiency, or deviation that renders the quality of any item unacceptable or indeterminate. The originator (any IT employee) of a nonconformance report will describe the finding on the Nonconformance Report provided for this purpose and will notify the IT PM and QAO. Each nonconformance will be reviewed and a disposition will be issued for the item, activity, or condition. The disposition of a nonconformance will be documented and approved by the IT organization responsible for issuing

the nonconformance. The QAO will concur with the disposition of the nonconformance prior to closure of the Nonconformance Report.

In addition, the IT PM will notify the USACE PM within 48 hours of significant nonconformances that could impact the project schedule or scope of work and will indicate the corrective action taken or planned.

SUBCONTRACTOR QA/QC REVIEW

IT has assigned personnel to monitor and review work performed by subcontractors in conjunction with this investigation. Mr. Mikael L. Spangberg will serve as the principal point-of-contact (POC).

The selection of qualified subcontractors will be accomplished in accordance with IT procurement and quality assurance (QA) procedures. Subcontractors such as drillers, geophysical specialists, surveyors, and environmental monitoring specialists, must satisfy predefined qualifications developed by the PM and IT that are defined in the procurement bid packages. Each subcontractor bid submittal is reviewed by technical personnel, purchasing, and QA personnel to verify that the bidders are technically qualified and can satisfy the project objectives. Before starting work, IT will perform a quality check to ensure that the subcontractor(s) has fulfilled the procurement requirements necessary to begin activities. Subcontractors involved in environmental measurements will be monitored by the IT Field Coordinator to verify the use of calibrated equipment and qualified operators.

CUSTOMER INVOLVEMENT

Customer involvement will be ongoing throughout the duration of this investigation, and IT personnel will be available as needed for question, consultation, etc. Project personnel may be reached at the following phone numbers:

Mr. Don C. Burton	(423) 690-3211 Ext. 2337	Fax (423) 690-4652
Mr. Mikael L. Spangberg	(423) 690-3211 Ext. 2378	Fax (423) 690-4652
Mr. Steven Muffler	(423) 690-3211 Ext. 2386	Fax (423) 690-4652
Mr. Tony Smith	(423) 690-3211 Ext. 2266	Fax (423) 690-4652
Ms. Melissa G. Smith	(423) 690-3211 Ext. 4131	Fax (423) 690-4652

Each work plan, report, or other deliverable will be submitted to the USACE Nashville for review and comment. All review comments will be addressed and incorporated into the final submittals.

DOCUMENTATION OF PROJECT DECISIONS AND RECORDS MANAGEMENT

The IT Project Records Clerk is responsible for maintaining control and retention for project-related records. Record control includes receipt from external and internal sources, transmittal, transfer to storage, and indication of record status. Retention includes receipt at storage areas, indexing and filing, storage and maintenance, and retrieval. IT will maintain the project repositories at 312 Directors Drive in Knoxville, Tennessee, for all project records, including correspondence. Records will be controlled and retained, as appropriate, in the office central files or laboratory files. The Project Records Clerk will assign control numbers to all outgoing documents and is responsible for properly filing the controlled records (except for those related to accounting, purchasing, and drafting, which are retained in the respective department files). IT will also provide the USACE Nashville District with a copy of all telephone memos, written correspondence, and meeting minutes regarding information related to the project within ten (10) days of the event. Copies of all records will be retained by IT for a minimum of seven (7) years after the end of the contract period. In addition, project records deemed to be of importance by the USACE will be turned over to the USACE at the time of project close-out.

PROJECT CLOSE-OUT

At the completion of this investigation, a project close-out meeting will be conducted. This will be at a time and place to be determined by Nashville District personnel, and may take the form of a teleconference. The purpose of this meeting will be to exchange feedback, discuss lessons learned, and conduct a final product verification.

Response to Technical Review Comments
Draft Quality Control Plan
Risk Assessment and Direct Push Investigation of the
Red Water Ponds Areas, Former Plum Brook Ordnance Works
Sandusky, Ohio

RESPONSE TO CELRN-EP-R-D TECHNICAL REVIEW COMMENTS QUALITY CONTROL PLAN FOR THE RISK ASSESSMENT AND DIRECT PUSH INVESTIGATION AT THE RED WATER PONDS AREAS, FORMER PLUM BROOK ORDNANCE WORKS, SANDUSKY, OHIO

Reference: *CELRN-EP-R-D (Michael Zoccola) Memorandum dated 8 December 1997 to CELRN-EP-R-M (Linda Ingram).*

Comment 1. [Page 6, paragraph at top of page] Please edit the sentence referring to "this cost proposal".

Response: *The sentence has been changed as requested.*

Comment 2. [Page 7, QA/QC Review] The sentence leading to the bullet item does not really introduce the bulleted phrases that follow it. Please edit the sentence.

Response: *The sentence has been changed.*

Comment 3. [Table 1] What degree of review will be conducted by the "Project Review" group? The text only describes a general project progress role while the table implies a more involved role by them. Please clarify.

Response: *The Project Reviewers will perform comprehensive reviews of prepared deliverables, focusing specifically on project objectives and their individual disciplines and project responsibilities. The extent of this review will be similar to that of the Peer Review, with the exception that Project Reviewers are members of the project team intimately involved in the day to day execution of the project.*

Comment 4. [Table 1] Does Tony Smith also have a technical discipline that can be listed (e.g. QA Officer/Engineer)?

Response: *Tony Smith does not have a technical discipline outside of his role as Quality Assurance Officer for the Knoxville office and the PBOW project. Specific technical QA/QC functions (i.e., QA of values in tables, computations, etc.) are performed by IT staff, other than the author or preparer, within the corresponding discipline that are familiar with the type of data or information that is presented.*

Comment 5. [Table 1] Does hydrogeologist Belinda Price have sufficient background to technically review an Ecological Risk Assessment Work Plan? It would generally be expected that someone with risk assessment experience might be required.

Response: *The table has been revised to indicate that Robin Zimmer (ecologist/risk assessor)*

will perform this review.

Comment 6. [Table 1] As the Report of Findings will include a risk assessment, wouldn't review by someone with risk assessment experience be required in addition to Belinda Price's review?

Response: *Belinda Price is indicated here as a peer reviewer, selected because she is a senior technical associate with an appropriate background in environmental investigations, she is independent of the PBOW project team, and she has past experience with the Nashville District. A review by "someone with risk assessment experience" will be satisfied through the listed review by Paul Goetchius as well as the senior-level review provided by Paul Goetchius and Robin Zimmer during the human health and ecological risk assessments, respectively. Robin Zimmer and Paul Goetchius (moved from Project Review) have been added to the Peer Review column.*

Comment 7. [Table 1 and Figure 1] If three principal authors are listed then the three principal authors will have to sign-off on the document(s). Please adjust the sign-off form (Originator?) to allow for this.

Response: *Multiple authors are indicated on Table 1 to permit a level of flexibility in the preparation of the various documents as the named individuals are not 100-percent dedicated to the PBOW projects. This approach permits us to provide a list of possible alternates or co-authors in the event that a named individual was unavailable due to other commitments, thus ensuring that progress will not be held up. If more than one person serve as authors, they will be so designated on the sign-off form at that time.*