JACOBS

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November 22, 2005

Attn: CELRN-EC-R-M (Linda Ingram)
110 Ninth Ave S. Room 682 Annex
Nashville, TN 372032

Subject: QCP Final, 2BG EE/CA, Plum Brook

Dear Linda,

Enclosed find one (1) copy of the Quality Control Plan-Final for the Engineering Evaluation/Cost Analysis, Reservoir No. 2 Burning Ground, Former Plum Brook Ordnance Works, Sandusky, Ohio".

Sincerely yours,

Douglas S. Hodge, Ph.D.

QUALITY CONTROL PLAN
for
ENGINEERING EVALUATION/COST ANALYSIS:
RESERVOIR NO. 2 BURNING GROUND
At the
FORMER PLUM BROOK ORDNANCE WORKS
SANDUSKY, OHIO

DRAFT

Prepared for:

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, NASHVILLE DISTRICT
NASHVILLE, TENNESSEE
CONTRACT DACW62-03-D-0004
Delivery Order No. 0007

JE JACOBS

Jacobs Engineering Group Inc.
125 Broadway Ave.
Oak Ridge, TN 37830

November 2005

The parties have reviewed and approved the following Quality Control Plan.

JACOBS ENGINEERING GROUP INC.
(JEG)

Douglas S. Hodge

JEG Program / Project Manager

Date 11/21/05

USACE-NASHVILLE DISTRICT
(CELRN)

CELRN Chief - HTRW

Date

CELRN/Plum Brook Technical Coordinator

Date 28 Nov 2006

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1.0 INTRODUCTION

This Quality Control Plan (QCP) has been prepared for the U.S. Army Corps of Engineers- Nashville District (CELRN). CELRN has contracted with Jacobs Engineering Group Inc. (Jacobs) to conduct an Engineering Evaluation/Cost Analysis (EE/CA) at the Reservoir No. 2 Burning Ground (2BG) located within the National Aeronautics and Space Administration (NASA) Plum Brook Station (PBS) in Sandusky, Ohio. PBS is part of the John Glenn Research Center at Lewis Field (GRC). Formerly at PBS, the Department of Defense (DOD) operated the Plum Brook Ordnance Works (PBOW) from 1941 to 1945 as a manufacturing plant for trinitrotoluene (TNT), dinitrotoluene (DNT), and pentolite.

In general, this Task Order addresses an EE/CA to be performed for the remediation of contaminated soil at 2BG, where decommissioned equipment and dismantled facilities were incinerated after the operation of PBOW. The most recent environmental investigation concerning 2BG was the Remedial Investigation performed in 2004 and 2005 (Jacobs, 2005). This investigation evaluated surface and subsurface soil, shallow and bedrock groundwater, surface water, and sediment for the presence of residual contamination from operations in these locations. This EE/CA will further delineate soil contamination and evaluate several remedial alternatives. The EE/CA objectives include:

- Further delineate the surface soil contamination at the site;
- Conduct treatability studies using bulk materials collected from the site;
- Evaluate the effectiveness of various remedial alternatives;
- Evaluate the cost of various alternatives;
- Determine the most cost effective alternative for remediating the soil at 2BG;
- Document findings in a final report.

This QCP will be used as guidance during the entire project. The purpose of the QCP is to assure delivery of a quality product and to document the critical project decisions during development of the project documents so they can be monitored by the CELRN. The QCP will be updated as necessary during the course of the project to account for changing project needs.

The following sections include the listed items:

Section 2.0 **SCOPE OF WORK** includes a clear description of the task(s).

Section 3.0 **QCP TEAM** includes: (1) the composition of the QCP team; (2) Jacobs personnel, qualifications and responsibilities; and (3) the composition of an independent review team.

Section 4.0 **SCHEDULE OF WORK** includes: (1) a schedule for an interim review of the QCP and the various plans and reports; and (2) a schedule for an independent review of the various plans and reports.

Section 5.0 **PROVISIONS FOR TECHNICAL CHECKS** includes: (1) a technical review checklist; (2) a general review checklist; and (3) the identification of quality indicators.

Section 6.0 **DOCUMENTATION OF PROJECT DECISIONS** includes such documents as meeting minutes and records of important telephone calls.

Section 7.0 **PROJECT CLOSEOUT** includes provisions concerning closeout of the project. Lessons learned and a final product verification are subjects of the close-out activities.

The QCP presents direction, purpose, and responsibilities for personnel assigned specific jobs, such as Client Project Manager (Technical Coordinator) and Contractor Project Manager. Recognized responsibilities will facilitate the success of fulfilling job responsibility and job accomplishment.

1.1 CLIENT INVOLVEMENT

Jacobs' direct client is the United States Army Corps of Engineers-Nashville District (CELRN). The U.S. Army is the direct client of the CERLN. OEPA is the regulatory agency for PBS. Client and regulatory agency involvement will be an important part of the success of this project. Client and regulatory agency responsibilities include, among others imposed by law, regulation, or the contract documents, the following:

- Full and complete disclosure of facts
- Provision of project funding
- Enhancement of communications
- Establishment of reasonable and attainable requirements
- Delegation or assignment of decision-making appropriately and support of that authority
- Being realistic in assumption of risks and liabilities
- Demanding quality projects
- Making timely decisions
- Allowing adequate time for good performance
- Allowing freedom for innovation
- Exercising financial responsibility and making timely payment

1.2 OVERALL MANAGEMENT APPROACH

USACE Huntington District (CELRH) is the primary point of contact with the regulatory agency but has designated the CELRN Technical Team to review the investigation report for completeness and technical accuracy. Following this review, Jacobs will submit these documents to the OEPA and NASA. It is understood that the CELRN Project Technical Team will also monitor project performance.

The organizational structure for investigative activities reflects the relationship previously described

between PBOW and the consulting team of CELRN, CELRH, and Jacobs who are responsible for planning, controlling, and executing the project tasks. The project organizational structure is designed to accommodate delineated task assignments and can be adjusted in response to changing project needs. The Project Management Control Process section of the Work Plan for the investigation should be referenced for detailed project organization and field personnel assignments.

1.3 JACOBS' QUALITY PROCESS

Jacobs' Quality System is based upon four fundamental elements:

1. The continuous elevation of quality consciousness throughout Jacobs and the involvement of personnel at all levels in the pursuit of continuous quality improvement.

2. The implementation of strategic planning for quality improvement.

3. The ongoing assessment of client expectations for quality and of client satisfaction with Jacobs deliverables and services.

4. The constant and uniform application of Quality Control procedures based upon requirements derived from both service standards and project specific criteria.

Jacobs' Quality System Manual (QSM) is the principal document of Jacobs' internal QC processes and provides the policies, procedures, and roles and responsibilities of individuals. Project specific quality planning documents are also required for each project. These include:

- Project Execution Plan (PEP) – The PEP is developed by the Project Manager at the initiation of the project and provides the project team with a clear, concise team organization, schedule, scope of work, and detailed administrative procedures for execution of the project.
- Client Expectation Survey – This process explores and documents the parameters, deliverables, and methods of performance that will meet the objectives of our client, CELRN and their client, CELRH.

1.4 INDEPENDENT TECHNICAL REVIEW

Jacobs will conduct an independent technical review (ITR) of all documents generated during the execution of this Task Order. These internal reviews will be performed by peers of the author prior to submission of the document to the CERLN and other reviewing agencies. A Certification of Independent Technical Review will be signed by each of the reviewers as well as the Jacobs Program Manager. The independent technical reviewers will issue comment on the document and the author will include these comments as appropriate.

1.5 ADDITIONAL QA WITH DrCHECKS

DrChecks (Design Review and Checking System, a web-based system developed by the Corps of Engineers) will be used to document and track all comments and responses regarding the Internal Technical Review (ITR) performed by Jacobs and Quality Assurance (QA) reviews performed by the customer, regulators, Corps and any other reviewers. It is Jacobs' responsibility to enter all non-CELRN comments and responses into the DrChecks system.

The Nashville District Engineering-Construction Division's Quality Manager (EC-QM) administers DrChecks locally. The DrChecks system has three categories of users - the designer, the reviewer, and the manager.

Jacobs' Project Manager, Doug Hodge, will coordinate with CELRN's Technical Coordinator, Ms. Linda Ingram, and request a project or review be added to DrChecks. At this time, the Project Manager will identify persons assigned to the project as designers and reviewers, the project start and completion dates, the type of review, and the start and stop dates of the review.

1.6 PROBLEM RESOLUTION

Problems pertaining to any aspect of the project will be addressed using the following guidelines.

- Identify quality problems.
- Propose recommendations for resolving quality problems.
- Independently confirm implementation and effectiveness of solutions.
- Provide documented assurance to management that, when problems are identified, further work performed is monitored carefully until the problems are suitably resolved.
- Identify and cite noteworthy practices that may be shared with others to improve the quality of their operations and products.

Any member of the project team can initiate the problem solving process. However, all quality problems will be brought to the attention of the CELRN Technical Coordinator. The quality problem and recommended solutions should be discussed in a meeting and/or phone conversation with all project personnel present.

2.0 SCOPE OF WORK

This project consists of conducting an EE/CA at the former PBOW Reservoir No. 2 Burning Ground located at PBS. This evaluation is being performed due to high levels of contamination in soil, which likely present an unfavorable risk to human health and the environment. Analytes in surface soil and subsurface burn layer material with elevated concentrations include nitroaromatics, PCBs, lead, and PAHs.

Specific objectives of the project are to develop planning documents for the delineation sampling and the treatability study, to perform the delineation sampling and bulk materials sampling, analytical work, and to prepare an EE/CA report. All work will be in accordance to the SOW in CELRN contract number DACW62-03-D-0004, Delivery Order Number 7 (17 October 2005),

hereafter referred as CELRN Delivery No. 7.

As part of the investigation, Jacobs will be conducting the following services described below as tasks:

Task 1: Preparation and Submittal of Quality Control Plan (QCP);
Task 2: Supplemental Delineation Sampling
Task 3: Treatability Studies;
Task 4: Engineering Evaluation/Cost Analysis;
Task 5: Action Memorandum;
Task 6: Project Management.

2.1 PLANNING DOCUMENTS AND FIELD SAMPLING

Tasks 1 and 2 are performed in the planning and data collection phase of the project. These tasks include a preparation and submittal of a QCP (Task 1) and preparation and submittal of a SAP addendum, data collection, and summary report (Task 2).

2.1.1 Task 1 – Completion of a Quality Control Plan

This QCP has been prepared according to CEORD 1110-1-9 *Quality Control* and ER 1110-1-12 *Quality Management* for this scope of work. The purpose of the QCP is to establish procedures and responsibilities within the Jacobs organization to assure delivery of a quality product and to document the critical project decisions and developments so they can be monitored by CELRN. The Draft QCP will become final upon its acceptance by CELRN. The QCP shall be updated as necessary during the course of the project to account for changing project needs. The QCP shall include, but not be limited to:

- A clear definition of the task(s)
- Identification of the functional team that will develop the required project documents including the SSHP and SAP Addendum, Delineation Sampling Summary Report, Treatability Study Work Plan, Treatability Study Summary Report, and the Draft and Final EE/CA Report.
- A discussion of customer involvement
- An interim document review schedule
- Identification of the independent review team
- The schedule for independent review
- Checklists
- Provisions for technical checks
- Meeting schedule
- Identification of quality indicators
- Documentation of project decisions, including minutes of meetings and records of important telephone calls

2.1.2 Task 2 – Preparation and Submittal of SAP Addendum, Field Data Collection, and Delineation Sampling Summary Report

A SAP Addendum will be developed for the delineation sampling, which will be in letter form as an addendum to the existing Site-Specific Sampling and Analysis Plan (SSAP). This addendum is required to detail the rationale and procedures employed to conduct the field activities and sample analyses of the investigation. Specifics such as sample locations and the rationale underlying the choice of those locations will be presented in the SAP addendum. All review comments will be incorporated into the final version of the SAP addendum.

The purpose of soil sampling is to further delineate the surface soil contamination outside the of the burn layer boundary, primarily to the west. The soil remedial investigation will be in accordance with CELRN Delivery No. 7 (17 October 2005), which indicates up to 15 soil samples will be collected for contaminant analysis. Jacobs will obtain the necessary utility clearances and permits from NASA. No brush clearing will be required since no large equipment will be used. Representative soil samples will be collected from the 0" – 1' interval through hand augering techniques.

A summary report addressing the results of the delineation sampling will be prepared in letter format. The report will provide contamination levels and maps illustrating the newly defined boundaries based on previously established project screening criteria.

2.2 TASK 3 – TREATABILITY STUDIES

Treatability studies will be performed using bulk materials to be collected from the site. These studies will be performed in a laboratory setting using burn layer material, surface soil from above the burn layer, and surface soil from the contamination area west of the burn area.

A treatability study plan will be submitted for review. The plan will address the proposed treatment technologies, pre-treatment and post-treatment monitoring plans, and analytical monitoring criteria.

Bulk materials will be collected with a shovel and containerized in 5 gallon buckets, which will be shipped overnight to the USACE ERDC laboratory in Vicksburg Mississippi. Contaminant concentrations will be evaluated by the laboratory before and after treatment applications. Approximately four treatment technologies will be evaluated.

A summary report will be prepared which addresses the results of the treatment technologies. The report will provide a discussion of technology effectiveness based on post treatment analytical monitoring and will evaluate material costs and quantities needed for successful full-scale remedial applications at the site.

2.3 TASK 4 – ENGINEERING EVALUATION/COST ANALYSIS

An EE/CA will be performed for a minimum of four remedial alternatives, which will include a final EE/CA report addressing the findings. The EE/CA will incorporate findings from the delineation sampling and treatability studies, which will be necessary for evaluating alternative effectiveness and cost estimating.

A final EE/CA report will be submitted, which will summarize cost effectiveness and implementation of each remedial alternative.

2.4 TASK 5 – ACTION MEMORANDUM

An action memorandum will be prepared that will document the EE/CA procedure and the decisions made by the project team. The memorandum will include the final chosen alternative to be implemented at the site and any project schedules agreed to.

2.5 TASK 6 – PROJECT MANGEMENT

All project management tasks including Delivery Order management, quality management, prime contract and subcontract administration, projects controls and closeout are included in this task.

3.0 QCP TEAM

The contractor, Jacobs, will develop the QCP and various plans and reports. By developing the QCP, plans, and reports, the Client's needs and requirements are recognized and stated at the beginning of the project. As a result, the goals of the project may better be achieved by the Contractor.

3.1 CELRN PERSONNEL, QUALIFICATIONS, AND RESPONSIBILITIES

Ms. Linda Ingram of CELRN is designated as the leader of the QA team and is also the Technical Coordinator for PBOW projects. Should a concern or need not be addressed satisfactorily by parties of the QA team, Ms. Ingram should be contacted and a meeting arranged between the parties to identify the Quality Defect. Ms. Ingram has several personnel available to her for consultation concerning technical matters of the project: Mr. Jim Beaujon, geologist; Ms Lannae Long, risk assessor/health and safety; Ms. Paula Coleman, chemistry; and Doug Mullendore, chemical engineering.

3.2 JACOBS PERSONNEL, QUALIFICATIONS, AND RESPONSIBILITIES

Jacobs' project team description discusses: (1) the overall management approach to the project; (2) the personnel performing or directing the investigation (including a description of their functions);

(3) the management and control of the project (including the project schedule); and (4) the deliverable reports.

The key Jacobs personnel responsible for project planning, control, and execution of the Remedial Investigation is the Jacobs Project Manager. The Project Manager is Mr. Doug Hodge. Additional key personnel include: the Site Manager and Site QC Manager, Mr. Al Hardesty; the Senior Project Engineer, Mr Charlie Hyer; the Quality Manager, Mr. Louis Vanacore; the Site Safety Officer, Mr. Sean Healey; the Program Manager and Technical Reviewer, also Mr. Doug Hodge; the Project Quality Manager, Mr. Steve Lampkins; the Chemist and Data Analyst, Mr. Lonnie Fallin; the Data Manager, Mr. David Greenberg; and the Safety and Health Manager, Sean Healy. The duties and responsibilities associated with these key Jacobs project positions are outlined below.

Program Manager

The Jacobs Program Manager, among other duties, manages the contract for the work at Plum Brook and provides status updates to Jacobs Management concerning the various projects at Plum Brook, including the RI, and provides oversight of the various Jacobs Project Managers when necessary. Duties may include:

- Maintaining contact and coordinating with the CELRN Technical Coordinator throughout the work.
- Negotiating and executing contracts and modifications.
- Ensuring that sufficient resources are available to the project.
- Assisting Jacobs Project Managers with required aspects of a given delivery order.
- Serving as Jacobs Project Manager for a given delivery order.
- Ensuring that Jacobs' QA/QC program is applied.

Doug Hodge holds a BA in Mathematics, MS in Environmental Engineering, and Ph.D. in Civil Engineering. He has 15 years experience in the environmental field. Doug Hodge will serve as Jacobs' Program Manager and as a Technical Reviewer for project related tasks.

Jacobs Project Manager

Jacobs' Project Manager (PM) will be responsible and accountable to CELRN for overall project direction and performance, including:

- Quality and timeliness of deliverables
- Application of resources
- Schedule, budget tracking, and revision, if necessary
- Progress reporting
- Assist in preparing and negotiating subcontracts
- Problem resolution
- Keeping all parties appropriately informed
- Principal project contact and liaison with the CELRN Technical Coordinator and Contracting Officer.

Doug Hodge will also serve as the Jacobs Project Manager. Mr. Al Hardesty will serve as a deputy PM as needed. Mr. Hodge will attend the scheduled meetings in Sandusky, Ohio.

Jacobs Site Manager / Site QC Manager

Jacobs' Site Manager will be responsible and accountable to CELRN for overall project direction and performance, including:

- Day-to-day oversight of investigation activities
- Schedule, budget tracking, and revision, if necessary
- Progress reporting
- Tracking work performed by subcontractors
- Problem resolution
- Keeping all parties appropriately informed
- Planning to avoid delays

The Site QC Manager will be responsible for ensuring the proper execution of field procedures. On quality control matters, the Site QC Manager reports to the Quality Manager and/or the Project Principal outside the normal project chain of command. On this Task Order, this individual will serve as the Deputy Project Manager as needed.

Mr. Al Hardesty holds a M.S. degree in Geology and is a Professional Geologist (PG) with over 16 years experience in environmental and hydrogeologic investigations. Mr. Hardesty will serve as Jacobs' Site Manager and Site QC Manager during the field investigation. He will also be the primary author of RI report and may attend some of the meetings. Mr. Hardesty will be responsible for preparation of presentations at these meetings.

Senior Project Engineer

The senior Jacobs project engineer will be responsible for coordination and review of all phases of the EE/CA and development of the EE/CA report.

Mr. Charlie Hyer holds a BS in Civil Engineering and an MBA. Mr. Hyer has 39 years of experience in environmental and civil engineering.

Data Manager

The Jacobs Data Manager is responsible for storage and retrieval of all electronic and hard copy data obtained at the site. Specifically, the Data Manager duties include:

- Reviewing laboratory contracts and specifications for compliance with the CELRN Delivery Order No. 2
- Specifying format of electronic data deliverables
- Entering laboratory and field data into an electronic relational database
- Submitting daily reports to data validators when necessary
- Storing hardcopy data
- Providing data tables for the RI Reports

Mr. Dave Greenberg holds a B.S. degree in Mechanical Engineering and has 20 years of experience in programming and data management. Mr. Dave Greenberg will serve as the Data Manager.

Quality Manager

The Jacobs Quality Manager is responsible for assuring that Jacobs' QA/QC program is implemented in all appropriate project activities.

Mr. Louis Vanacore holds a B.S. degree in Mechanical Engineering. Mr. Vanacore has 35 years of experience and will serve as the Quality Manager.

Project Quality Manager

The Jacobs Project Quality Manager is responsible for assuring that Jacobs' Quality Assurance Project Plan (QAPP) and the QA/QC program is implemented in all appropriate project activities, including:

- QC protocols and procedures
- Audits to see that all deliverables are properly reviewed and checked.
- Documenting that all quality objectives have been met.
- Implementing corrective actions.

Mr. Steve Lampkins holds a B.S. degree in Geology and is a Professional Geologist (PG) with 19 years experience in environmental projects. Mr. Lampkins will serve as the Project Quality Manager.

Chemist / Data Analyst

The Jacobs Chemist is responsible for assuring that the analytical requirements are met and validating the resulting data. The Chemist provides technical peer review on sampling plans and other technical program documents.

Mr. Lonnie Fallin holds a B.A. degree in Chemistry has 18 years experience in the field of analytical chemistry. Mr. Fallin will serve as both the Chemist and Data Analyst for this project.

Health and Safety Manager

Field activities will be conducted in accordance with the safety and health requirements of the SWSHP and the SSHP.

Mr. Sean Healy holds a B.S. degree in Environmental Science and an MBA with over 15 years experience in environmental health and safety programs. Mr. Healy will serve as the Health and Safety Manager.

Site Safety Officer

Site Safety Officer responsibilities are detailed in the SSHP Addendum.

Mr. Sean Healey holds a B.S. degree in Environmental Science and an MBA with over 15 years experience in environmental health and safety programs. Mr. Healey will serve as the Site Safety Officer.

3.3 INTERNAL TECHNICAL REVIEW TEAM

The ITR Team will be responsible for reviewing the Work Plans and the RI Reports. The ITR Team will be required to meet the schedule of work presented in Section 4.0 Schedule of Work. Requirements of the document review are discussed in Section 5.0 Provisions For Technical Checks.

Jacobs personnel described above in Section 3.2 will serve as originators of documents or sections of documents and may also serve as reviewers/checkers of documents or sections they have not originated. Jacobs QA/QC check off sheets will be distributed within the completed deliverables for review. Additional Jacobs personnel listed below may be involved in the review of documents related to activities associated with the requirements of this project. The following lists the authors and members of the ITR Team for each of the project deliverables:

Document	Author	ITR Reviewers	Qualification	Phone#	E-mail
EE/C Reports	Charlie Hyer	-	Civil Engineer	(865) 220-5674	charles.hyer@jacobs.com
		Doug Hodge	PGM / PM	(865) 220-4874	doug.hodge@jacobs.com
		Al Hardesty	Geologist / Site Mgr.	(865) 220-6043	al.hardesty@jacobs.com
SAP	Al Hardesty	-	Senior Geologist	(865) 220-6043	al.hardesty@jacobs.com
		Lonnie Fallin	Chemist	(508)743-0214 x238	lonnie.fallin@jacobs.com
		Doug Hodge	PGM / PM	(865) 220-4874	Doug.hodge@jacobs.com
		Steve Lampkins	Geologist	(865) 220-4852	steve.lampkins@jacobs com
Sampling Reports	Al Hardesty		Geologist	(865) 220-6043	al.hardesty@jacobs.com
		Doug Hodge	PGM/PM	(865) 220-4874	doug.hodge@jacobs.com
		Steve Lampkins	Geologist	(865) 220-4852	steve.lampkins@jacobs com
		Ken Black	Hydro-geologist	(865) 220-4801	ken.black@jacobs.com

A certification statement signed by the independent reviewers identified in the QCP will be included with each product submitted to CELRN. The statement will declare that the reviewers have reviewed the product; their comments have been satisfactorily resolved; and the product is ready for release to CELRN. Comments generated by Jacobs' independent reviewers and the resolution of those comments shall be submitted with the certification statement.

4.0 SCHEDULE OF WORK

4.1 DOCUMENT SCHEDULE

The review by CELRN includes review of this QCP and the required plans and reports developed by Jacobs. The plans and reports are due to CELRN in accordance with the following schedule:

NTP	27 Oct 2005
Draft QCP	14 Nov 2005
Final QCP	18 Nov 2005
Draft SAP	21 Nov 2005
Final Work Plans	2 Dec 2005
Delineation Sampling	5 –8 Dec 2005
Delineation Sampling Summary Report	23 Feb 2006
Treatability Study Plan	21 Nov 2005
Treatability Study	09 Dec 2005 – 31 Jan 2006
Treatability Report	10 Jan 2005 – 21 Jan 2006
Draft EE/CA	25 Apr 2006
Final EE/CA	24 Aug 2006
Draft Action Memorandum	11 Sep 2006
Complete All Tasks	17 Oct 2006

4.2 FIELD SCHEDULE

Fieldwork will be performed December 5 – 8, 2005. Fieldwork will consist of suface soil sampling for the delineation of contamination zones, collection of bulk materials for the treatability study, land surveying, and IDW management.

5.0 PROVISIONS FOR TECHNICAL CHECKS

Jacobs' SOPs dictate procedures to be used to review and check company deliverables. Documents are checked for concept suitability, theory, applicability and correct numbers. The checks are done according to explicit Quality Control procedures. Additionally, documents are to receive a Technical Coordination Review and if needed, a Document Coordination Review during the development process. A Final Package Review is required prior to the deliverable being submitted.

The following subsections present check lists for technical and general review of project documents. The checklists are to be read before, during and after review of project documents.

5.1 TECHNICAL REVIEW CHECKLIST

The technical review checklist of a project document includes at a minimum:

- Scope of Work is properly presented and explained

- Objectives clearly stated
- Historic information is correct
- Number of samples is correct
- Laboratory methods are correct
- Figures are clear and contain a north arrow, scale, source, title block and legend
- Field procedures follow referenced procedure manuals
- Recommendations and conclusions of the investigation and their basis are clearly identified and discussed in the report
- Response to comments are understandable and clearly worded in complete sentences

5.2 GENERAL REVIEW CHECKLIST

The general review check list of a project document includes at a minimum:

- Table of contents is correct
- Acronyms are defined in table of contents and text and used consistently throughout
- Figures and sections are referenced correctly
- Grammar and spelling are correct
- Comments are understandable and clearly worded in complete sentences

5.3 QUALITY INDICATORS

An evaluation of the overall project quality will be performed by the Project Manager on a periodic basis. This evaluation will include an assessment of the items outlined in Sections 5.1 and 5.2, and an additional evaluation of those quality indicators that accurately describe the status of the project. Those additional quality indicators for this project will include the following:

- Compliance with Approved Project Schedule. Schedule variances will be outlined by the Project Manager, and corrective actions will be discussed with the CERLN.
- Compliance with Scope of Work and Project Planning Documents. Out of scope items will be identified early-on, and discussed with the CERLN. Variances with the Project Planning Documents will be tracked and corrective actions implemented per the approved plans.
- Number and Content of the Comments on each Project Deliverable. The CERLN, CERLH, NASA, and OEPA typically review project deliverables. A subjective evaluation on the number and types of review comments will be performed by the Project Manager, and corrective actions implemented as necessary to improve deliverable format, content, technical presentation, etc., on subsequent deliverables.
- Overall Client Satisfaction with Work Products. The Project Manager will communicate with the CERLN on a routine basis, and overall client satisfaction will be assessed. The Project Manager, along with the Program Manager, will identify areas for improvement, and determine an implementation plan for those improvements.

6.0 DOCUMENTATION OF PROJECT DECISIONS

Jacobs will make a record of substantive phone conversations, written correspondence, and meetings regarding information related to the performance of this work. These records will be maintained in the Jacobs project files, and will be submitted to the CERLN during the course of the performance of the work when appropriate.

7.0 PROJECT CLOSEOUT

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