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**APPENDIX G**

**Construction Quality Control Plan**

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**COOPER DRUM COMPANY  
OPERABLE UNIT 1  
CONSTRUCTION QUALITY CONTROL PLAN**

Prepared For:  
Contract No. 68-W-98-225/WA No. 047-RDRD-091N  
U.S. Environmental Protection Agency  
Region IX  
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## TABLE OF CONTENTS

<b>1.0</b>	<b>INTRODUCTION.....</b>	<b>1-1</b>
<b>2.0</b>	<b>GENERAL REQUIREMENTS .....</b>	<b>2-1</b>
2.1	CQCP Objectives .....	2-1
2.2	CQC Manager .....	2-1
2.3	CQC Phases .....	2-1
2.3.1	Preparatory Phase .....	2-1
2.3.2	Initial Phase.....	2-2
2.3.3	Follow-Up Phase.....	2-2
2.3.4	Final Phase.....	2-7

## LIST OF TABLES

Table 2.1	Preparatory Phase CQC Elements and Required Testing .....	2-3
Table 2.2	Initial Phase CQC Elements and Required Testing .....	2-5
Table 2.3	Follow-Up Phase CQC Elements and Required Testing .....	2-6

## ACRONYMS AND ABBREVIATIONS

CQC	construction quality control
CQCP	construction quality control plan
EPA	United States Environmental Protection Agency
OU	operable unit
ppb	parts per billion
PVC	polyvinyl chloride
QC	quality control
RFI	Request for Information
TCE	trichloroethene

## **1.0 INTRODUCTION**

This is the construction quality control plan (CQCP) to be implemented during the installation of the Operable Unit (OU) 1 remedial action remedy, which includes a source area remedy and downgradient containment and treatment at the Cooper Drum Company Superfund Site (Cooper Drum) located in Southgate, California. The source area remedy includes ozone/hydrogen peroxide injection, groundwater extraction downgradient of the ozone/hydrogen peroxide injection with ex situ treatment, and injection of treated groundwater above the source area. The downgradient containment and treatment strategy includes two groundwater extraction wells at the leading edge of the 5 parts per billion (ppb) trichloroethene (TCE) groundwater plume and a bioremediation barrier upgradient of the two extraction wells. The extracted groundwater will be treated aboveground and discharged to the sanitary sewer under permit from the Los Angeles County Sanitation District.

## **2.0 GENERAL REQUIREMENTS**

The CQCP provides the quality control (QC) objectives, the construction quality control (CQC) manager responsibilities, the CQC phases, the types and frequencies of inspections and tests to be performed, and the required CQC reporting and documentation required for successful completion of the construction activities.

### **2.1 CQCP Objectives**

The objective of this CQCP is to provide guidelines ensuring that required levels of quality are achieved during construction activities performed by the contractor at Cooper Drum. The method, process, and standards to perform the work are detailed in the project specifications and design drawings.

### **2.2 CQC Manager**

The CQC manager is responsible for overall management of the CQC system and has the authority to act independently in all QC matters. Some of the individual responsibilities of the CQC manager include:

- Managing all on-site and off-site inspections and testing;
- Evaluating the results of the inspections and testing;
- Inspecting and accepting/rejecting materials delivered to the site;
- Notifying the site construction manager of acceptance or rejection of the work;
- Documenting all inspections, testing, and notifications using daily CQC reports; and
- Reviewing all submittals (Requests for Information [RFIs], As-Builts, etc) related to quality control with the engineer.

### **2.3 CQC Phases**

To ensure that activities comply with the requirements of the specifications, the CQC oversight will be conducted in four phases: preparatory, initial, follow-up, and final. The elements of the first three phases are described below and presented in detail in Tables 2.1 through 2.3, respectively. These tables highlight some, but not all, of the CQC elements, required verification points, related specification sections, and reporting requirements. The contractor must be familiar with the work, method, and QC requirements of the work as detailed on the design drawings and specifications. Any discrepancies and uncertainties must be brought to the attention of the United States Environmental Protection Agency (EPA) and the engineer for clarification, and are the responsibility of the contractor.

#### **2.3.1 Preparatory Phase**

A preparatory CQC phase will be performed prior to the start of construction. As part of this phase, the CQC manager will:

- Review and QC design drawings;
- Ensure that the client and site engineers/site manager have reviewed the design drawings and are aware of all aspects of the planned construction activities;
- Confirm that all required materials and/or equipment have been purchased and delivered to the site;

- Inspect the material and equipment and ensure that they meet all required specifications and conform to the design drawings (see Table 2.1);
- Inspect the work area and ensure that all required preliminary work has been completed, surface obstacles have been removed, underground utilities and obstructions have been identified, and all permits (if applicable) and clearances have been acquired; and
- Formally record and report results of the preparatory phase inspection utilizing the CQCP reporting and acceptance documentation.

### **2.3.2 Initial Phase**

The initial CQC phase will be performed after the first segments of the site remedy are constructed. During this phase, the CQC manager will:

- Inspect and verify the quality of workmanship, including quality of excavation, trenching, pipe layout, soil compacting, and backfilling;
- Verify that preliminary work is in compliance with specifications, design drawings and dimensions, and contract requirements;
- Review and verify construction methods;
- Review and verify results of QC tests (see Table 2.2); and
- Formally record and report the results of initial phase inspection utilizing the CQCP reporting and acceptance documentation.

### **2.3.3 Follow-Up Phase**

Follow-up inspections will be performed periodically to ensure continuing compliance with contract requirements. The CQC manager will:

- Review and verify construction methods, including treatment compound construction and system installation;
- Review and verify results of QC tests (see Table 2.3);
- Oversee completion of each definable feature of work;
- Prepare a “punch list” of items that do not conform to the approved specifications and indicate the estimated date that deficiencies will be corrected; and
- Formally record and report results of follow-up inspections utilizing the CQCP reporting and acceptance documentation.

- Prepare a “punch list” of items that do not conform to the approved specifications and indicate the estimated date that deficiencies will be corrected; and
- Formally record and report the results of the follow-up inspection utilizing the CQCP reporting and acceptance documentation.

**TABLE 2.1**

**Preparatory Phase CQC Elements and Required Testing**

<b>CQC Element</b>	<b>Required Verification/Testing</b>	<b>Specifications Reference/Tests</b>	<b>Required Reporting</b>
Mobilization/Site Preparation	<ul style="list-style-type: none"> <li>• Coordinate with EPA representative for site access.</li> <li>• Review and verify design drawings and maps.</li> <li>• Verify location of temporary utilities.</li> <li>• Verify allowable staging areas.</li> </ul>	Specifications Section: 01000 Site Description and Project Background 01010 Summary of Work 01039 Project Coordination and Meetings 01210 Preconstruction Conference 01501 Site Specific Requirements 01545 Protection of Work and Property 01600 Material and Equipment	Daily CQC Report
Utilities Survey	<ul style="list-style-type: none"> <li>• Prepare and submit dig permit applications.</li> <li>• Verify that all utilities, including fiber optic lines, have been identified and clearly painted along the entire length of the proposed excavation.</li> </ul>	Specifications Section: 01010 Summary of Work 01545 Protection of Work and Property	Daily CQC Report
Conveyance and Utility Piping Construction	<ul style="list-style-type: none"> <li>• Verify that all location, elevation, and installation requirements are established and dig permits are acquired as needed.</li> <li>• Verify that field engineering sketches are developed depicting the locations of any key items not shown on the drawings.</li> <li>• Verify that all design drawings have been reviewed and approved.</li> <li>• Verify compliance in pipe and size, quantity, and materials.</li> <li>• Verify that pipe bedding and backfill materials are available and compliant.</li> </ul>	Specifications Section: 02222 Excavation, Trenching, and Backfilling for System Piping 02234 Base Course 02551 Bituminous Paving for Roads, Streets, and Open Storage Areas 02558 Bituminous Tack Coat 02576 Fence and Concrete Removal 02579 Restoration of Rigid Pavements 02610 Pipe and Fittings	<ul style="list-style-type: none"> <li>• Daily CQC Report</li> <li>• Acceptance Certificates</li> </ul>

**TABLE 2.1 (Continued)**

<b>CQC Element</b>	<b>Required Verification/Testing</b>	<b>Specifications Reference/Tests</b>	<b>Required Reporting</b>
Conveyance and Utility Piping Construction (Cont'd)	<ul style="list-style-type: none"> <li>• Verify that stockpile or disposal sites are approved for excavated material.</li> <li>• Verify that the installation minimizes bends and elbows and results in efficient arrangement.</li> </ul>		
Concrete and Structural Work	<ul style="list-style-type: none"> <li>• Verify that the proposed materials meet specification.</li> <li>• Verify line and grade of all concrete pads.</li> <li>• Review the requirements of the design drawings and specifications.</li> <li>• Review grade, size, and layout of reinforcing steel.</li> <li>• Review, inspect, and verify that the designed thickness of concrete slabs meet criteria.</li> <li>• Verify the installation of equipment and equipment housing.</li> </ul>	Specifications Section: 02234 Base Course 03100 Concrete Formwork 03200 Concrete Reinforcement 03251 Anchors and Inserts	<ul style="list-style-type: none"> <li>• Statement of Compliance from Vendor</li> <li>• Daily CQC Report</li> <li>• Test Reports</li> </ul>
Electrical Work	<ul style="list-style-type: none"> <li>• Verify that the proposed materials meet specification.</li> <li>• Review the requirements of the design drawings and specifications.</li> </ul>	Specifications Section: 16010 Basic Electrical Requirements 16050 Basic Electrical Materials and Methods 16450 Grounding 16455 Dry Type Transformers 16460 Feeder and Branch Circuits 16470 Equipment Connections 16500 Lighting 16900 Instrumentation and Control	Daily CQC Report

CQC = construction quality control  
 EPA = United States Environmental Protection Agency

**TABLE 2.2**

**Initial Phase CQC Elements and Required Testing**

<b>CQC Element</b>	<b>Required Verification/Testing</b>	<b>Specifications Reference/Tests</b>	<b>Required Reporting</b>
Mobilization/Sie Preparation	<ul style="list-style-type: none"> <li>Verify that all health and safety measures are in place.</li> <li>Verify that site security and access controls comply with requirements.</li> <li>Verify that the contractor has mobilized sufficient equipment, materials, and labor to complete the work.</li> </ul> Verify that all personnel have current health and safety certificates.	Specifications Section: 01000 Site Description and Project Background 01010 Summary of Work 01039 Project Coordination and Meetings 01045 Cutting and Patching 01210 Preconstruction Conference 01501 Site Specific Requirements 01545 Protection of Work and Property 01600 Material and Equipment	Daily CQC Report
Utilities Survey	<ul style="list-style-type: none"> <li>Verify that all dig permits have been obtained.</li> <li>Verify that all utilities have been marked out.</li> </ul>	Specifications Section: 01010 Summary of Work 01050 Field Engineering 01545 Protection of Work and Property	Daily CQC Report
Conveyance and Utility Piping Construction	<ul style="list-style-type: none"> <li>Ensure that the job site is maintained in a neat and orderly manner.</li> <li>Verify that all conveyance piping is pressure tested for leaks.</li> </ul>	Specifications Section: 02222 Excavation, Trenching, and Backfilling for System Piping 02610 Pipe and Fittings	<ul style="list-style-type: none"> <li>Daily CQC Report</li> <li>Acceptance Certificates</li> <li>Test Reports</li> </ul>
Concrete and Structural Work	<ul style="list-style-type: none"> <li>Verify that provisions have been arranged for on-site monitoring.</li> </ul>	Specifications Section: 01045 Cutting and Patching 02234 Base Course 03100 Concrete Formwork 03200 Concrete Reinforcement 03251 Anchors and Inserts 03300 Cast in Place Concrete	<ul style="list-style-type: none"> <li>Daily CQC Report</li> <li>Acceptance Certificates</li> <li>Test Reports</li> </ul>
Site Restoration	<ul style="list-style-type: none"> <li>Verify that the contractor has employed all equipment, materials, and labor required to provide a high quality job.</li> </ul>	Specifications Section: 01220 Progress Meetings 01300 Submittals 01400 Quality Control 01600 Materials and Equipment 01710 Final Cleaning	Daily CQC Report

CQC = construction quality control

**TABLE 2.3**

**Follow-Up Phase CQC Elements and Required Testing**

<b>CQC Element</b>	<b>Required Verification/Testing</b>	<b>Specifications Reference/Tests</b>	<b>Required Reporting</b>
Mobilization/Site Preparation	<ul style="list-style-type: none"> <li>• Verify that all plans and procedures are being followed.</li> <li>• Verify that daily progress meetings are being performed.</li> </ul>	Specifications, Division 1 through 16, specifically: 01220 Progress Meetings	Daily CQC Report
Conveyance and Utility Piping Construction	<ul style="list-style-type: none"> <li>• Verify that proper installation methods and procedures are followed, particularly when backfilling and compacting the trench.</li> <li>• Verify that safety identification tape is installed as specified over entire length of pipeline.</li> <li>• Verify that as-built records are maintained.</li> <li>• Verify that photograph log is maintained.</li> <li>• Verify that PVC glues and primers are stored in proper environment.</li> <li>• Verify that pipes are kept clean of debris.</li> <li>• Verify that enclosed pipes are covered at the end of the workday to prevent undesirable materials from entering pipelines.</li> <li>• Verify that all conveyance piping has been pressure tested and leaking sections have been repaired/replaced.</li> </ul>	Specifications Section: 01720 Project Record Documents 02222 Excavation, Trenching, and Backfilling for System Piping 02610 Pipe and Fittings	<ul style="list-style-type: none"> <li>• Daily CQC Report</li> <li>• As-Built Records</li> <li>• Photograph Logs</li> </ul>
Concrete and Structural Work	<ul style="list-style-type: none"> <li>• Verify that testing results are in compliance.</li> <li>• Verify that proper workmanship is occurring.</li> </ul>	Specifications Section: 03100 Concrete Formwork 03200 Concrete Reinforcement 03300 Cast in Place Concrete	Daily CQC Report

**TABLE 2.3 (Continued)**

<b>CQC Element</b>	<b>Required Verification/Testing</b>	<b>Specifications Reference/Tests</b>	<b>Required Reporting</b>
Site Restoration and Landscaping	<ul style="list-style-type: none"> <li>• Verify that final grading matches pre-construction conditions.</li> <li>• Verify that work complies with specifications.</li> </ul>	Specifications Section: 01220 Progress Meetings 01300 Submittals 01400 Quality Control 01600 Materials and Equipment 01700 Project Closeout 01710 Final Cleaning 01720 Project Record Documents	Daily CQC Report

CQC = construction quality control  
 PVC = polyvinyl chloride

#### 2.3.4 Final Phase

At the completion of the site remedy construction, the CQC manager will conduct a pre-final inspection to ensure that the work is, in fact, completed and that all inspection documentation (including daily CQC, test, and acceptance reports) is up to date. The CQC manager will prepare a final punch list of items that do not conform to design drawings or required specifications, and will provide an estimated date by which the deficiencies will be corrected. The CQC manager will also define what QC tests (if any) need to be performed and will review the test results and accept or reject the affected area of work.

After the deficiencies have been addressed, the CQC manager, the site construction manager, and an EPA representative will perform a final completion acceptance inspection. The CQC manager will prepare and submit a record of the final inspections.