environmental
properties management, LLC

January 16, 2020

Mr. Ken Kalman
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852-2738

Mr. Paul Davis
Oklahoma Department of Environmental Quality
707 North Robinson
Oklahoma City, OK 73101

Mr. Robert Evans
U.S. Nuclear Regulatory Commission
1600 East Lamar Blvd; Suite 400
Arlington, TX 76011-4511

Re: Docket No. 70-925; License No. SNM-928
Proposed Revisions to Quality Assurance Documents

Dear Sirs:

Solely as Trustee for the Cimarron Environmental Response Trust (CERT), Environmental Properties Management LLC (EPM) submits herein two documents in response to comments identified during discussions with US Nuclear Regulatory Commission (NRC) staff.

Because the decommissioning of facilities and equipment had been completed prior to the transfer of the license to the CERT, the NRC had requested that EPM implement a quality assurance program that complies with Reg. Guide 4.15, *Quality Assurance for Radiological Monitoring Programs (Inception Through Normal Operations to License Termination) – Effluent Streams and the Environment.* Section 14 of the November 2018 *Facility Decommissioning Plan – Rev 1* (the DP) described the Cimarron Site's quality assurance program, committing to compliance with Reg. Guide 4.15.

When NRC staff began the acceptance review of the DP, they felt the description of the quality assurance program was not adequate to perform a detailed technical review of the DP. During meetings conducted in April 2019, NRC staff requested that EPM submit the site-specific Quality Assurance Program Plan along with responses to the February 2019 request for supplemental information. EPM submitted *Quality Assurance Program Plan – Rev 4* (the QAPP) to the NRC in May 2019.

The decommissioning of the Site will involve the construction, operation, and eventual decontamination and final status survey of both facilities and equipment. Discussions with NRC staff in September 2019 led to the conclusion that the requirements of NUREG-1757, *Consolidated Decommissioning Guidance* (the Guidance), pertain to more aspects of

9400 Ward Parkway • Kansas City, MO 64114
Tel: 405-642-5152 • jlux@envpm.com

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decommissioning than Reg. Guide 4.15. The QAPP must therefore address all the criteria identified in the Guidance. EPM therefore directed Enercon Services to conduct a thorough review of the Guidance to identify all criteria that are applicable to the planned decommissioning of the Cimarron Site.

In addition, the decision was made to include the QAPP as an appendix to the DP. Because the full QAPP will be included as an appendix to the DP, Section 14 no longer needs to present comprehensive description of the QAPP. Instead, it will identify the requirements of the quality assurance program and identify where within the QAPP those requirements are addressed. Attachment 1 contains a proposed revision of Section 14 of the DP which EPM believes is more appropriate than the Section 14 contained in the November 2018 DP.

Attachment 2 contains a revised draft of the QAPP. EPM understands that additional changes to the QAPP may be made after receipt of comments from the NRC based on their detailed technical review of the DP (including this QAPP). Consequently, this version of Revision 4 is not the "final" Revision 4; the final version of Revision 4 will be produced after the detailed technical review of the DP.

These documents are not provided in "tracked changes" format because the changes were so significant that it could be challenging to read the documents with all tracked changes underlined and/or crossed out. If you desire a copy of the document in "tracked changes" format, EPM will send you a copy.

Sincerely,

Jeff Lux, P.E.
Trustee Project Manager

Attachments

cc: Michael Broderick, Oklahoma Department of Environmental Quality (electronic copy only)
NRC Public Document Room (electronic copy only)

ATTACHMENT 1
PROPOSED REVISION OF SECTION 14 OF
FACILITY DECOMMISSIONING PLAN – REV 1

14.0 QUALITY ASSURANCE

The CERT Trustee is dedicated to promoting quality at every level of Cimarron Site work, and to fostering an environment that encourages continual quality improvement. Implementation of the CERT Quality Assurance (QA) Program provides for adequate controls to support the Site decommissioning.

The current revision of the Cimarron Site Quality Assurance Program Plan (QAPP) is included as Appendix P. The QAPP establishes a Quality Assurance Program meeting the applicable requirements of the following:

- NRC Regulatory Guide 1757, Consolidated Decommissioning Guidance, Decommissioning Process for Material Licenses
- NRC Regulatory Guide 4.15 (NUREG 4.15), Quality Assurance for Radiological Monitoring Programs (Inception Through Normal Operations to License Termination) – Effluent Streams and the Environment
- NRC License SNM-928

In addition, quality requirements not required by NUREG 4.15 or NUREG 1757 were included in this QA program; these were obtained from various sources including NQA-1, Quality Assurance Requirements for Nuclear Facility Applications. Where applicable, revisions to the QAPP will be managed in accordance with License Condition 27(e).

The QAPP includes requirements for the following:

14.1 QUALITY ASSURANCE PROGRAM

QAPP Section 1.0 provides a description of the Quality Assurance Program. The QAPP includes the following information regarding the CERT Quality Assurance Program:

- QAPP Section 1.1 includes a commitment that activities affecting the quality of Site decommissioning will be subject to the applicable controls of the QA program and activities covered by the QA program are identified on program defining documents.
- QAPP Section 1.1 provides a brief summary of the company's corporate QA policies.
- QAPP Sections 1.3 and 1.4 include a description of provisions to ensure that technical and quality assurance procedures required to implement the QA program are consistent with regulatory, licensing, and QA program requirements and are properly documented and controlled.
- QAPP Section 1.1 provides a description of the management reviews, including the documentation of concurrence in these quality-affecting procedures.
- QAPP Section 1.1 includes a description of the quality-affecting procedural controls of the principal contractors, including documentation of the acceptance of the controls before the initiation of activities affected by the program.
- QAPP Section 5.6 provides a description of how NRC will be notified of changes (a) for review and acceptance in the accepted description of the QA program as presented or referenced in the DP before implementation and (b) in organizational elements within 30 days after the announcement of the changes

(note that editorial changes or personnel reassignments of a nonsubstantive nature do not require NRC notification).

- QAPP Section 13.2 contains a description of how management (above or outside the QA organization) regularly assesses the scope, status, adequacy, and compliance of the QA program.
- QAPP Section 5.0 provides a description of the procedures to ensure that instructions, procedures, and drawings include quantitative and qualitative acceptance criteria for determining that important activities have been satisfactorily performed. QAPP Section 6.1 includes requirements for design control.

14.2 GLOSSARY

QAPP Section 2.0 provides a glossary defining terms related to the quality assurance program.

14.3 ORGANIZATIONAL STRUCTURE AND RESPONSIBILITIES

QAPP Section 3.0 provides the structure of the organization as it relates to the Quality Assurance Program. The authorities, duties, and responsibilities of the positions within this organization, down to the first-line supervisory level, are described. This includes the following:

- A description of the QA program organization.
- A description of the QA program management organization.
- QAPP Section 3.2 provides descriptions of the duties and responsibilities within the organization and how delegation of responsibilities is managed within the decommissioning program.
- A description of how work performance is evaluated is provided in QAPP Section 4.5.
- A description of the authority of each unit[1] within the QA program.
- An organization chart of the QA program organization is provided in QAPP Section 3.1.
- QAPP Section 3.2.2 includes a description of the Trustee Project Manager responsibilities for ensuring that activities affecting quality are (a) prescribed by documented instructions, procedures, and drawings and (b) accomplished through implementation of these documents.

14.4 QUALIFICATIONS AND TRAINING OF PERSONNEL

QAPP Section 4.0 provides for personnel qualification, training, self-assessment, and documentation.

- QAPP Section 4.0 includes a description of the instruction provided to personnel responsible for performing activities affecting quality pertaining to the purpose, scope, and implementation of the quality-related manuals, instructions, and procedures.
- QAPP Section 4.1 provides content and frequency of QAPP training.
- QAPP Section 4.2 provides a description of the training and qualifications of personnel verifying activities affecting quality in the principles, techniques, and requirements of the activity being performed.

[1]As presented in NUREG 1757, the term "unit(s)" may not always be applicable. In this section, and in the QAPP, description of individual personnel responsibilities and authorities may be substituted for responsibility or authority of a "unit".

- QAPP Section 4.4 requires, for formal training and qualification programs, documentation including attendees, date of attendance, and the objectives and content of the program.
- QAPP Section 4.3 includes a description of the self-assessment program to confirm that activities affecting quality comply with the QA program.
- QAPP Section 4.3 provides a commitment that persons performing self-assessment activities are not to have direct responsibilities in the area they are assessing.

14.5 OPERATING PROCEDURES AND INSTRUCTIONS

QAPP Section 5.0 provides that requirements for Cimarron project activities are defined in written operating procedures and instructions. These include, but are not limited to, the following:

- Radiation Protection Program Procedures
- Health and Safety Plan
- Quality Assurance Program Plan
- Independent Review
- Responsibility for approval of plans and procedures
- Program change

14.6 DESIGN

QAPP Section 6.0 provides requirements for design control. These design control requirements include:

- Contractor and Subcontractor (Vendor) Design
- Design Interfaces
- Design Inputs and Objectives
- Design Outputs
- Design Review
- Design Changes

14.7 PROCUREMENT AND CONTROL OF MATERIALS, EQUIPMENT, PARTS, AND SERVICES

QAPP Section 7.0 provides the quality requirements for procurement and control of materials, equipment, parts, and services. The requirements include:

- Control of Purchased Materials, Equipment, Parts, and Services
- Inspection of Materials, Equipment, and Parts (Items)
- Control of Materials

14.8 SAMPLING, ANALYSES, MEASUREMENTS, AND PROCESSES

QAPP Section 8.0 provides quality requirements for control of sampling, analyses, measurements, and processes. These requirements include:

- Radiation protection
- Environmental sampling
- Effluent monitoring systems
- Laboratory quality control
- Construction quality control
- Process control
- Data quality control

14.9 CONTROL OF MEASURING AND TEST EQUIPMENT

Implementation of the QAPP describes the methods and procedures that are used to ensure that only accurate and calibrated test equipment will be used during the decommissioning project. QAPP Section 9.0 includes the following information regarding the test and measurement QA program:

- A summary of the test and measurement equipment used in the program.
- A description of how and at what frequency the equipment will be calibrated.
- A description of the daily calibration checks that will be performed on each piece of test or measurement equipment.
- A description of the documentation that will be maintained to demonstrate that only properly calibrated and maintained equipment was used during the decommissioning.

14.10 HANDLING, STORAGE, AND SHIPPING

QAPP Section 10.0 establishes measures to control the handling, storage, shipping, cleaning, and preservation of material and equipment in accordance with procedures and instructions to prevent damage or deterioration.

14.11 CONTROL OF NONCONFORMING ITEMS AND EQUIPMENT

QAPP Section 11.0 provides requirements for control of nonconforming items and equipment.

14.12 DOCUMENT CONTROL

QAPP Section 12.0 describes how documents associated with the QA program are developed, issued, and revised and includes the following:

- QAPP Sections 12.0, 12.1, and 12.2 include a summary of the types of QA documents included in the program.
- QAPP Section 12.3 provides a description of how the licensee develops, issues, and revises QA documents.
- QAPP Section 12.4.4 describes handling of retired documents.

14.13 AUDITS AND ASSESSMENTS

QAPP Section 13.0 requires the use of assessments and audits to evaluate the effectiveness of the Cimarron Quality Assurance Program. These include the following with regard to audits and surveillances:

- QAPP Section 13.1 includes a description of the audit program, including the procedures for conducting the audits or surveillances.
- A description of the records and documentation generated during the audits and the manner in which the documents are managed is provided in QAPP Sections 12 and 13.3.
- Corrective actions, including a description of all follow-up activities associated with audits or surveillances, are described in QAPP Section 14.0.
- QAPP Section 14.0 provides a description of the trending/tracking that will be performed on the results of audits and surveillances.

14.14 CORRECTIVE ACTION

The Site QA program includes adequate procedures and controls to identify and correct conditions that will affect quality. QAPP Section 14.0 includes the following information regarding corrective action:

- A description of the corrective action procedures for the facility, including a description of how the corrective action is determined to be adequate.
- A description of the documentation maintained for each corrective action and any follow-up activities by the QA organization, after the corrective action is implemented.
- A description of the trending/tracking that will be performed on the results of audits and surveillances.

ATTACHMENT 2
PROPOSED REVISION OF DRAFT
QUALITY ASSURANCE PROGRAM PLAN – REV 4

Approvals	
Approved by Quality Assurance Coordinator: Charles Beatty Jr.	
Signature:	Date:
Approved by Radiation Safety Officer: Jay Maisler, CHP	
Signature:	Date:
Approved by Trustee Project Manager: Jeff Lux	
Signature:	Date:
Approved by Administrator, Cimarron Environmental Response Trust: Bill Halliburton	
Signature:	Date:

Summary of Changes

Revisions to this document will be identified, and revisions or addenda will be issued as needed. The Project Manager maintains the signed original of this document; no controlled copies are issued. The end user is responsible to verify with the Trustee Project Manager that any hard copy being referenced is the current revision. A summary description of each revision or addenda will be noted in the following table.

Revision Number	Date	Comments
Rev. 0	April 11, 2011	Original
Rev. 1	February 29, 2012	Changes Assigned Leader to Activity Leader, other editorial changes
Rev. 2	September 19, 2013	General review of Plan incorporating editorial changes, Revised Section 2.2 and added Section 2.6.
Rev. 3	April 7, 2016	General revisions per triennial QA program review
Rev 4		Revisions and reorganization throughout in anticipation of expanded project scope.

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1.0 QUALITY ASSURANCE PROGRAM

1.1 Introduction

As Trustee of the Cimarron Environmental Response Trust (CERT), Environmental Properties Management LLC (EPM) is committed to the decommissioning and remediation of the Cimarron site in accordance with all license and regulatory requirements. EPM requires the development and implementation of a Quality Assurance Program that provides for the assurance of the required level of quality in the planning, execution, and documentation of quality-critical work performed at the site. This Quality Assurance Program Plan (QAPP) documents the program that will be implemented at the Cimarron site.

The QAPP provides for:

- Products and services that comply with license and regulatory requirements.
- Quality management systems and procedures that are documented, communicated, controlled, and effectively put into practice.
- Opportunities to identify and improve the organization and the quality, compliance and cost effectiveness of work performed.
- Timely evaluation of personnel resources, needs, skills and performance to stress the importance of, and identify opportunities for, continual quality improvement.
- Data quality needed to support Cimarron decommissioning goals and assure compliance with nuclear and environmental compliance requirements.
- Documented management reviews indicating concurrence with quality-affecting procedures.
- Triennial management reviews of the effectiveness of the quality assurance program.

- Management of changes to the quality assurance program in accordance with License Condition 27(e).

EPM retains contractors to perform work at the site. This QAPP establishes a program requiring that quality be incorporated in the planning, performance, and documentation of work. For contractors performing quality-critical work, EPM management will review quality assurance and quality control programs to assure that controls meet the requirements of the Cimarron program. This QAPP also establish a program for the evaluation and qualification of contractors and subcontractors, communication of quality requirements to contractors and subcontractors, and the monitoring of contractor and subcontractor performance and product quality. Acceptance of contractor quality-affecting procedural control documentation will be completed before the initiation of activities affected by the program.

1.2 Background

The Cimarron facility operated as a nuclear fuel production facility under Licenses SNM-928 (for uranium processing) and SNM-1174 (for mixed oxides processing) until the facility was closed in 1975. Decommissioning began in 1976. License SNM-1174 was terminated in 1993; decommissioning in accordance with the requirements of NRC License SNM-928 is ongoing. The decommissioning of equipment, structures, and soil is complete.

The current mission at the Cimarron Site (Site) is the remediation of groundwater to criteria established by the US Nuclear Regulatory Commission (NRC) and the Oklahoma Department of Environmental Quality (DEQ). Groundwater remediation requires planning, data collection and management, and decision-making; all of which are subject to NRC- and DEQ- established quality requirements. Quality requirements are met through implementation of the Site Quality Assurance Program (inclusive of the QAPP, implementing procedures, and supporting

documents). This quality program is periodically revised to reflect changes associated with the ongoing environmental remediation.

The Cimarron Environmental Response Trust (Trust) was established in accordance with the January 26, 2011 Consent Decree and Environmental Settlement Agreement executed by the former licensee, the Department of Justice (DOJ), the Nuclear Regulatory Commission (NRC) and the State of Oklahoma. The NRC license was transferred to the CERT, which owns the Cimarron Site and manages that accounts that provide the funding for the remediation of the Site. Environmental Properties Management LLC (EPM) is the Trustee for the CERT; because the CERT has no employees, the Trustee functions as the licensee.

1.3 Purpose and Applicability

The Quality Assurance Program ensures that technical and quality assurance procedures required to implement the QA program are consistent with regulatory, licensing, and QA program requirements and are properly documented and controlled.

The Cimarron Quality Assurance (QA) program shall be documented by written policies and procedures. Sufficient records of conduct and performance are required to demonstrate program adherence. Contractors or subcontractors performing support activities (e.g., sampling, analysis, data evaluation, design, and record generation) shall retain records sufficient for the licensee to review to demonstrate compliance with applicable program elements.

The purpose of this QAPP is to document QA Program requirements for the Cimarron Decommissioning Project. Implementation of this QAPP is through written procedures and instructions as described in Section 5.0.

Activities affecting the quality of site decommissioning will be subject to the applicable controls of the QA program and activities covered by the QA program are identified on program defining documents.

As the defining document defining the quality assurance program implemented at the Cimarron Site, the QAPP describes ***what*** will be done to provide for acceptable quality. Quality Assurance procedures implement the program; they describe ***how*** quality objectives will be identified and quality documented in the performance of quality critical work.

The Quality Assurance Program applies to all quality-critical work performed at the Site, which is work intended to satisfy regulatory and/or license requirements, including, but not limited to:

- Groundwater monitoring well drilling, installation, and development
- Sampling and analysis of environmental media
- Design and evaluation of groundwater characterization and remediation plans
- Design of groundwater treatment processes
- Groundwater remediation activities
- Packaging and transportation of waste
- Other activities directly affecting license termination and site closure decision-making, as determined by the Trustee PM or QAC

The Quality Assurance Program does not apply to activities such as mowing, fence repair, building maintenance, or other activities not related to regulatory requirements.

1.4 Regulatory Requirements

This QAPP establishes a quality assurance program meeting the applicable requirements of the following:

- NRC Regulatory Guide 1757, Consolidated Decommissioning Guidance, Decommissioning Process for Material Licenses
- NRC Regulatory Guide 4.15 (NUREG 4.15), Quality Assurance for Radiological Monitoring Programs (Inception Through Normal Operations to License Termination) - Effluent Streams and the Environment
- NRC License SNM-928

In addition, quality requirements not required by NUREG 4.15 or NUREG 1757 were included in this QA program; these were obtained from various sources including NQA-1, *Quality Assurance Requirements for Nuclear Facility Applications* and NUREG 1757, *Consolidated Decommissioning Guidance*.

1.5 Plan Contents

This QAPP includes the following sections:

1.0 Quality Assurance Program

2.0 Glossary

3.0 Organizational Structure and Responsibilities

4.0 Qualifications and Training of Personnel

5.0 Operating Procedures and Instructions

6.0 Design

7.0 Procurement and Control of Materials, Equipment, Parts, and Services

8.0 Sampling, Analyses, Measurements, and Processes

9.0 Control of Measuring and Test Equipment

10.0 Handling, Storage, and Shipping

11.0 Control of Nonconforming Items and Equipment

12.0 Documents and Records

13.0 Audits and Assessments

14.0 Corrective Actions

2.0 GLOSSARY

Activity Plan: A document that identifies:

- A non-routine quality activity
- The objective of the activity
- Radiological, environmental, and safety hazards associated with the work, and actions to mitigate those hazards
- Quality control and quality assurance requirements
- Measures to address quality control and quality assurance requirements
- Work instructions to be followed to assure successful completion of the activity.

Cimarron Environmental Response Trust (CERT): The Trust was established in accordance with the January 26, 2011 Consent Decree and Environmental Settlement Agreement between the Department of Justice (DOJ), the Nuclear Regulatory Commission (NRC) and the State of Oklahoma. The CERT is the NRC licensee, owns the Cimarron Site, and provides the funding for the remediation of the Site. Environmental Properties Management LLC (EPM) is the Trustee for the CERT and functions as the licensee.

Cimarron Site (Site): The property owned by the CERT.

Contractor: Any organization or individual contracted directly to the Trustee.

Controlled Document: Any document the Trustee Project Manager or Quality Assurance Coordinator determines should be controlled so that the user possesses the most current revision of the document. This includes the QAPP and all implementing procedures.

Decisions Affecting License Termination or Site Closure: Decisions that support characterization and achievement of remediation goals. These includes goals established in accordance with requirements of the NRC and the State of Oklahoma.

Hold Point: A stopping point in a procedure or workplan requiring a signature or initials to verify that data has been recorded or that required actions are complete before proceeding. Hold Points are used as quality assurance measures in Activity Plans.

Quality Activity: Any activity that impacts the characterization or remediation of the site, or which impacts the achievement of license termination or site closure.

Quality Data: Data that directly or indirectly support decisions affecting license termination or site closure. Quality data collection and data management are subject to the requirements of the QAPP.

Quality Assurance (QA): Quality Assurance comprises all those planned and systematic evaluations that are necessary to provide adequate confidence in the assessment of monitoring results, such as quality control measures.

Quality Assurance Program Plan (QAPP): The primary quality program document, which describes and govern the Quality Assurance Program.

Quality Assurance Program (QAP): The licensee's program for quality assurance, as described in the Quality Assurance Program Plan (QAPP).

Quality Assurance Records: Records that document that quality-critical work complied with the requirements specified in plans, procedures, drawings, or specifications.

Quality Control (QC): Quality Control (QC) comprises those QA actions that provide a means to measure and control the characteristics of equipment and processes to meet established standards.

Subcontractor: Any organization or individual retained by a contractor.

Trustee: Environmental Properties Management (EPM), the Trustee identified in the January 26, 2011 Consent Decree and Environmental Settlement Agreement with the Department of Justice (DOJ), the Nuclear Regulatory Commission (NRC) and the State of Oklahoma.

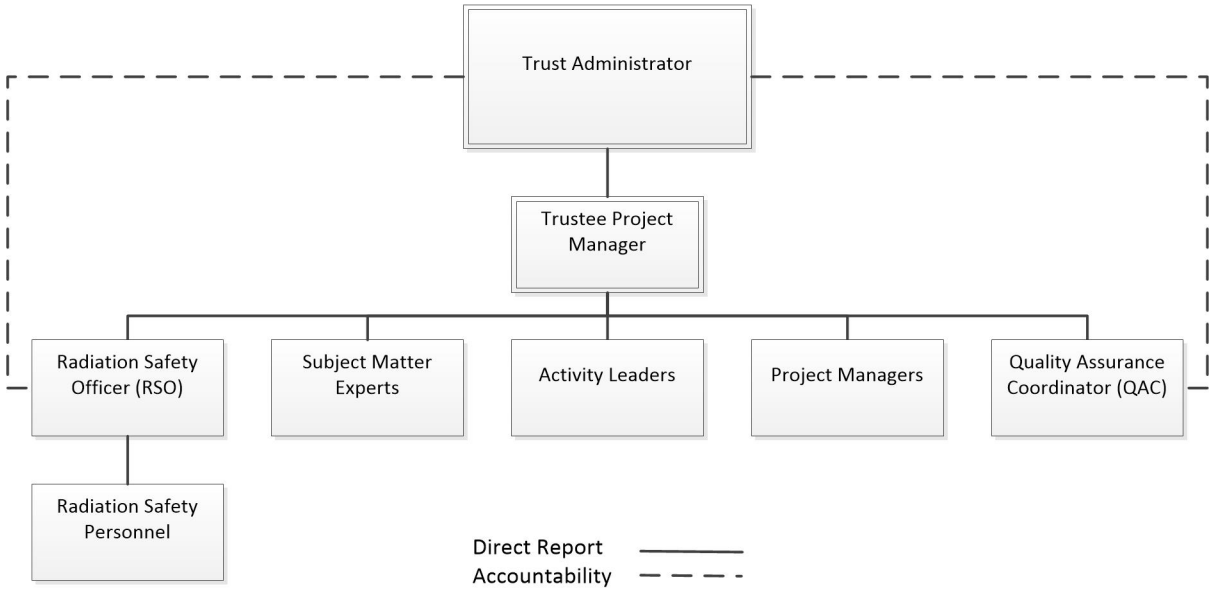
3.0 ORGANIZATIONAL STRUCTURE AND RESPONSIBILITIES

This section provides the structure of the organization as it relates to the Quality Assurance Program. The authorities, duties, and responsibilities of the positions within this organization, down to the first-line supervisory level, are described. These include (where applicable) responsibilities for review and approval of written procedures and the preparation, review, and evaluation of monitoring data and reports.

3.1 Organization Chart

The Organization Chart for the CERT is presented below:

Figure 3-1
The Cimarron Environmental Response Trust Organization



3.2 Duties and Responsibilities

3.2.1 *Trust Administrator*

The CERT Trust Administrator has overall responsibility for the administration of the Trust. This includes providing support for quality assurance and radiation safety functions at the Site. The Trust Administrator is also responsible for the review and approval of the QAAP and RPP.

3.2.2 *Trustee Project Manager*

The Trustee Project Manager (PM) is responsible for physical and financial management of remediation and compliance activities at the Site. This includes direct responsibility for the implementation and maintenance of the Quality Assurance Program Plan as well as delegation of personnel authorities and responsibilities. The Trustee PM is responsible to communicate to all site personnel and contractors the requirements of the QAPP.

The PM shall ensure that activities affecting quality are (a) prescribed by documented instructions, procedures, and drawings; and (b) accomplished through implementation of these documents.

The Trustee Project Manager also is responsible for review and approval of quality-critical plans.

3.2.3 *Project Manager*

Project Managers are responsible for the planning and execution of individual quality-critical activities performed under separate contract with the Trust. Project Managers are

responsible for individual aspects of the decommissioning program, such as remediation system design, groundwater treatment system design, and radiation protection.

3.2.4 *Radiation Safety Officer*

The RSO is responsible for maintenance and implementation of the radiation protection program. The RSO is responsible to review plans for all activities, provide guidance regarding compliance with NRC license and regulatory requirements, and to manage the health physics staff. The RSO chairs the As Low As Reasonably Achievable (ALARA) Committee and is responsible for bringing radiation protection and safety issues to the attention of the ALARA Committee.

The RSO is also responsible for review and revision of the RPP and related procedures, radiation exposure monitoring, dose reporting, the radiological instrument program, and all levels of radiation safety training. The RSO has authority to go directly to the Trustee PM or the Trust Administrator to resolve radiation protection issues if needed.

3.2.5 *Quality Assurance Coordinator*

The QAC has the following responsibilities:

- Approves and/or reviews all plans and procedures for the Project.
- Maintains the Quality Assurance Program Plan, develops implementing procedures and instructions, and monitors their implementation.
- Schedules and performs QA audits and assessments on a periodic basis to assess QA Program effectiveness, and to evaluate the compliance of work performed with quality program requirements. The QAC also makes updates and improvements to the plan and procedures as needed.

- Coordinates issuance of deficiency reports, identifies non-conformances and approves corrective actions required to achieve the required quality for activities/items.
- Verifies and approves corrective actions initiated to address deficiencies or non-conformances.
- Reviews and accepts QA programs of contractors and/or subcontractors supplying quality related services.
- Provides QA training to personnel (including contractor and subcontractor personnel) who manage or perform activities affecting quality.
- Maintains a list of subject matter experts and their area of expertise.
- The QAC can assign a designee to perform specified functions assigned to the QAC. Throughout this QAPP, references to QAC responsibilities or functions also apply to a designee as specified by the QAC. The QAC has authority to go directly to the Trustee PM or the Trust Administrator to resolve quality issues if needed. The QAC has authority to go directly to the Trustee PM or the Trust Administrator to resolve quality issues if needed.

3.2.6 *Subject Matter Expert*

A subject matter expert (SME) is a knowledgeable and experienced individual who uses his or her expertise in a specific discipline to review and approve plans for quality-critical work from a technical perspective and to determine the qualification of personnel to perform quality-critical work. The SME assists in identifying and applying critical knowledge relevant to the project, works to ensure that project objectives are relevant and valid, works to refresh and expand the knowledge base.

SMEs will determine and document personnel task qualification as related to specific procedures (e.g. sampling and analysis procedures, construction oversite, reporting).

The SME participates in meetings, reviews project member contributions to ensure quality and relevancy of material, provides process analysis expertise, and participates in the project as a member of the decommissioning team.

3.2.7 *Activity Leader*

The Activity Leader is the person to whom the Trustee Project Manager assigns to direct work described in an Activity Plan. Activity Leader has the following responsibilities:

- Reviews and approves Activity Plans (and generates the plan if assigned).
- Performs pre-job briefs and post-job debriefs as necessary for purposes of incorporating worker suggestions and lessons learned.
- Ensures that personnel under their direction are trained on the Activity Plan and comply with the Activity Plan requirements.
- Ensures that personnel under their direction are aware of the radiological and non-radiological conditions (i.e. industrial health & safety and environmental hazards) in the work area.
- Provides information on projected radiological work activities to the Radiation Safety Officer or designee.
- For radiological work, informs the Health Physics Technician of any changes or anticipated changes in work scope.
- Informs the Radiation Safety Officer or designee when radiological work performed under an Activity Plan is completed.

- Ensures that all required documentation listed in the Activity Plan is compiled in the site paper files and electronic copies are provided to the Trustee PM.
- Close-out approval of the Activity Plan.

3.2.8 *Radiation Monitoring Personnel*

The qualifications of personnel needed to perform radiation monitoring functions are defined and documented in the Cimarron Radiation Protection Plan.

3.2.9 *All Project Personnel*

All personnel are encouraged to be diligent in the performance of their work to maintain the level of quality required by plans, procedures, and instructions. In addition, personnel are encouraged to be attentive to any quality issues that may exist in the work of their peers, suppliers, contractors, and subcontractors; because a consistent and exemplary level of quality can only be obtained through vigilant attention to the whole of the work; not just the pieces for which an individual is immediately responsible.

All personnel are responsible to:

- Maintain familiarity with the applicable requirements of the QA Program, and maintaining a personal commitment to implementing the QA Program requirements in their everyday work.
- Identify opportunities for quality improvement.
- Conscientiously use stop work authority as needed to mitigate risks to safety, security, or quality.

3.3 Organizational Units

As Trust Administrator, EPM delegates and manages work responsibility for the Cimarron project through contractors and subcontractors. Contractors and subcontractors can be considered "units", as outlined below.

- Radiation Protection
- Environmental Health and Safety
- Quality Assurance
- Groundwater Remediation and Extraction Design
- Groundwater Treatment Design
- Groundwater and Soil Sampling
- Groundwater Extraction and Injection System Construction
- Groundwater Treatment System Construction
- Groundwater Extraction and Injection Operation and Monitoring
- Groundwater Treatment Operation and Monitoring
- Waste Management

4.0 QUALIFICATIONS AND TRAINING OF PERSONNEL

Personnel responsible for performing activities affecting quality pertaining to the purpose, scope, and implementation of the quality-related manuals, instructions, and procedures shall be provided verified training and instruction as described in this section. Personnel will maintain proficiency by retraining, reexamining, and recertifying, or by periodic performance reviews, as appropriate. Continual training will be conducted as needed to ensure that personnel maintain awareness of events and issues that could affect quality.

Certain training will also be provided to site personnel who perform non-quality-critical work at the site (e.g. site maintenance).

Training and qualification records will be maintained by the QAC.

4.1 Personnel Training

Guidance for the content and frequency of QAPP training is provided in Quality Assurance Implementing Procedure QAIP 4.3. All training will be documented.

4.1.1 *Management Personnel*

Management Personnel will receive, at a minimum, training on the QAPP.

4.1.2 *Field Supervisors and Activity Leaders*

Field Supervisors and Activity Leader will be required to have the following training:

- QAPP
- Quality Assurance Implementing Procedures (QAIPs) (as applicable)
- Radiation Safety as required by the Radiation Safety Program

- Site Orientation
- Site-specific Health and Safety Program
- Sampling and Analysis Plan and Procedures (as applicable)
- OSHA Construction Safety (as applicable)

4.1.3 *Technical Personnel*

Persons performing technical work on quality-critical activities (e.g. sampling, data analysis, design) are consider Technical Personnel. Technical Personnel will receive training on the QAPP as well as any other specific instructions determined by the Trustee PM, RSO, or QAC.

4.1.4 *Radiation Protection Personnel*

Training for individuals needed to carry out assigned radiological monitoring functions will be defined and documented in the RPP. Radiation protection personnel will also receive training on the QAPP as well as any other specific instructions determined by the Trustee PM, RSO, or QAC.

4.1.5 *All Site Personnel*

All personnel who work on the Cimarron Site will receive a site orientation and applicable health and safety training as determined by the Trustee PM.

4.1.6 *Retraining*

Retraining will be required as follows:

- Radiation Protection Plan – minimum annually; when plan is revised; or more frequent as determined by the RSO.

- Quality Assurance Program Plan - minimum annually; when plan is revised; or more frequent as determined by the Trustee PM or QAC.
- Health and Safety Plan - minimum annually; when plan is revised; or more frequent as determined by the Trustee PM or QAC.
- Retraining requirements for other plans, procedures and instructions will be determined by the Trustee PM, QAC, RSO, or SME.

4.2 Qualifications

The following sections define personnel qualification requirements. Section 7.1.1 of this QAPP establishes a program for the evaluation and qualifications of contractors and subcontractors (i.e. Vendor Qualifications).

4.2.1 *Lead Auditors and Inspectors*

Auditors for internal audits and assessments, as well as for external audits of laboratories and other service providers whose work is critical to quality, must be approved by the QAC or designee. The Trustee PM may designate personnel for these functions with a written justification of their qualifications for an audit or assessment.

Personnel performing inspections need not be approved Auditors, and may be qualified based on their skills, experience, or task specific training, as approved by the QAC and/or the Trustee PM.

4.2.2 *Technical Personnel*

Qualification requirements for Technical Personnel who work on quality activities may be determined by:

- Trustee Project Manager
- Quality Assurance Coordinator
- Subject Matter Expert
- Activity Leader

4.2.3 *Radiation Protection Personnel*

The qualifications for radiation protection personnel will be defined and documented in accordance with the RPP.

4.2.4 *All Personnel*

Qualification requirements for any personnel working on the Cimarron Project will be determined by their supervisors. Other personnel qualification requirements may be provided in procurement documents (Section 7.0).

4.3 Self-Assessment

A self-assessment program will be developed by CERT management to confirm that activities affecting quality comply with the QA program. On an annual basis, individual personnel will be asked to identify any issues related to procedures or instructions. Persons performing self-assessment activities will not have direct responsibilities in the area they are assessing.

4.4 Documentation of Training

Documentation of all formal training and job qualification programs shall include attendees, date of attendance, and the objectives and content of the program.

4.5 Evaluation of Work Performance

The Trustee Project Manager will be responsible for evaluation of work performance through the conduct of inspections or assessments. Inspections may include the review of records that demonstrate that items received, or work performed complied with requirements. Assessments may consist of observations of work performed to determine compliance with requirements. The Trustee may delegate inspections or assessments to Subject Matter Experts, as needed. Work performance evaluation will include consideration of the following:

- Safety record
- Quality of work
- Maintenance of personnel qualifications
- Ability to meet deadlines
- Audits

5.0 OPERATING PROCEDURES AND INSTRUCTIONS

As described in this section, requirements for Cimarron project activities are provided in written operating procedures and instructions. The Trustee PM is responsible to determine when activities require specific procedures or other documentation to control the activity and maintain quality.

Where applicable, all instructions, procedures, and drawings shall include quantitative acceptance criteria (such as those pertaining to dimensions, tolerances, and operating limits) and qualitative acceptance criteria (such as workmanship samples) for determining that important activities have been satisfactorily performed.

Monitoring for compliance with quality documents may be conducted at any time by the QAC (or designee).

5.1 Radiation Protection Program Procedures

Radiation Protection Procedures and desk instructions provide the procedures and instructions for performing activities associated with the radiation safety program. Procedures address categories of tasks (e.g., contamination surveys), whereas desk instructions contain more detailed information on the use of specific instruments (e.g., operating the frisker).

5.2 Health and Safety Plan

The Site Health and Safety Plan (HASP) provides requirements for non-radiological activities associated with the Cimarron Site.

5.3 Quality Assurance Program Plan

This Quality Assurance Program Plan (QAPP) provides the Quality Assurance Program requirements for the Cimarron Project. Implementation of this QAPP is through written Operating Procedures and Instructions as described below.

For routine activities, Project Plans (e.g., Sampling and Analysis Plan) describe *what* routine activities are performed. Their related procedures and instructions (e.g., Sampling and Analysis Procedures), as well as standard operating procedures (SOPs), describe *how* routine activities are performed.

Whether an activity is considered routine or non-routine will be determined by the Trustee PM. Quality requirements for non-routine activities will usually be defined in Activity Plans.

5.3.1 *Project Plans*

Project Plans identify requirements related to radiation protection, quality assurance, health and safety, and sampling and analysis of environmental media. These plans identify work performed to comply with those requirements.

5.3.2 *Sampling and Analysis Plan*

The Sampling and Analysis Plan (SAP) specifies sample collection requirements for environmental media and includes sampling requirements for quality assurance quality control (QA/QC) programs. It also specifies sampling equipment decontamination, documentation, sample preparation and shipment, and laboratory analytical methods. Finally, it specifies requirements for groundwater monitoring well installation and abandonment.

5.3.3 *Sampling and Analysis Procedures (SAPs)*

Quality requirements for repetitive routine sampling and analysis activities will be provided in Sampling and Analysis Procedures. This will include a procedure for discharge sampling.

5.3.4 *Standard Operating Procedures (SOPs)*

Where practicable, Standard Operating Procedures will provide quality and other requirements for routine activities such as sampling and analysis and system operation.

5.3.5 *Activity Plans*

Quality requirements for non-routine activities not subject to specific contracts with contractors or subcontractors will be defined in Activity Plans. Activity Plans will identify:

- The name of the non-routine quality-related activity
- The objective of the activity
- Radiological, environmental, and safety hazards associated with the work, and actions to mitigate those hazards
- Quality control and quality assurance requirements, and measures to address quality control and quality assurance requirements, including Hold Points
- Work instructions to be followed to assure successful completion of the activity.

5.3.6 *Quality Assurance Implementing Procedures (QAIPs)*

Quality Assurance Implementing Procedures (QAIPs) will provide instructions needed to implement the Quality Assurance Program. A list of QAIPs will be maintained by the QAC.

5.3.7 *Construction Execution Specifications*

In some instances, quality control requirements for contracted work, such as construction (i.e. method), will be provided in standard format such as MasterFormat, or referenced to industry-specific Standard Specifications. These requirements will be identified by the Trustee PM, QAC, or Subject Matter Experts and communicated through Activity Plans or other written instructions.

5.3.8 *Construction Drawings*

Quality control requirements may be included on Construction Drawings. These requirements will be identified by the Trustee PM, QAC, or Subject Matter Experts and communicated through Activity Plans or other written instructions.

5.4 Independent Review

All instructions, procedures, and drawings must show evidence of independent review and approval. These documents must also bear a unique identifying number, date, and revision number.

Drawings must also identify the name of the preparer as well as the name of the independent reviewer and the date of the independent review.

5.5 Plan and Procedure Approval

The following table provides the requirements for approval of plans and procedures:

Table 5-5
Plan and Procedure Approval Responsibility

Document Description	Trustee Administrator	Trustee PM	RSO	QAC	Health & Safety Manager	Subject Matter Expert
Radiation Protection Plan	X	X	X	X		
Radiation Protection Procedure			X			
Desk Instruction			X			
HASP	X	X	X		X	
QAPP	X	X	X	X		
Standard Operating Procedure		X	X	X		X
Sampling and Analysis Procedure						X
Activity Plan		X	X	X		X
QAIP	X	X	X	X	X	X

5.6 Program Change

Editorial changes or personnel reassignments of a nonsubstantive nature do not require NRC notification. Where applicable, revisions to the QAPP will managed in accordance with License Condition 27(e).

Condition 27(e) of NRC License SNM-928 provides flexibility for the licensee to make changes to the NRC-approved Decommissioning Plan (DP) and the Radiation Protection Plan (RPP), provided certain constraints are met. A Quality Procedure entitled "Program Change Evaluation Process", provides the process for the review and implementation of such changes to ensure that the license condition requirements have been met.

6.0 DESIGN

For the Cimarron Quality Assurance Program, design is defined as the process of devising a system, structure, component, or process to meet desired needs. Design examples include:

- Radiation protection control and measurement
- Sampling and analytical requirements
- Data review requirements
- Groundwater remediation system installation and operation
- Groundwater treatment system installation and operation

The purpose of this section is to provide the quality requirements for design control.

6.1 Design Control

Applicable regulatory and quantitative and qualitative design requirements for quality-related systems, structures, components, or processes must be provided through specifications, drawings, procedures, and/or instructions. Deviations from such standards are controlled through the review and approval of qualified individuals, and the approval of deviations shall be documented.

6.1.1 *Contractor and Subcontractor (Vendor) Design*

EPM uses contractors and subcontractors to complete most design activities. These vendors are approved in accordance with Section 7.0 of this QAPP. The quality assurance program of the individual vendor may be reviewed and approved by the Trust. The vendor's compliance with its quality assurance program will then constitute compliance with this quality assurance program.

6.1.2 *Design Interfaces*

The Trustee PM will provide a vehicle for the identification and control of design interfaces and for coordination among participating design teams.

6.1.3 *Design Inputs and Objectives*

The first step in design control is the identification of design inputs (i.e., those inputs which must be known to develop a design that achieves the desired outcome). The identification of design inputs and objectives are captured in a Basis of Design generated by the contractor or subcontractor preparing the design.

The Trustee PM will provide for the review of quality requirements for design inputs and evaluate the Basis of Design against the requirements of SNM-928, commitments to the NRC and ODEQ, and other applicable requirements and regulations.

6.1.4 *Design Outputs*

Design outputs may be plans, permit applications, drawings, or specifications.

6.1.5 *Design Review*

All designs for Quality Activities are subject to a documented independent review. This review will verify or check the adequacy of the design using alternate or simplified calculation methods, or by performance of a suitable testing program.

The verifying or checking process shall be performed by individuals or groups other than those who performed the original design, but who may be from the same organization. Design documents must be signed by the preparer and the person who performed the independent review.

The Trustee PM (or a designated SME) must approve all designs.

Contractors or subcontractors used for design or design review must be approved in accordance with Section 7.0 of this QAPP.

6.1.6 *Design Changes*

Design changes, including field changes, shall be subject to the same requirements for review and approval as those applied to the original.

7.0 PROCUREMENT AND CONTROL OF MATERIALS, EQUIPMENT, PARTS, AND SERVICES

This section provides the quality requirements for procurement and control of materials, equipment, parts, and services.

7.1 Control of Purchased Materials, Equipment, Parts, and Services

Measures shall be established to ensure that purchased material, equipment, parts, and services, whether purchased directly or through contractors and subcontractors, conform to procurement documents.

7.1.1 *Procurement of Materials, Equipment, and Parts*

Procurement of quality-related materials, equipment, and parts from approved vendors will require inclusion of applicable quality requirements in procurement documents. Inspection requirements and acceptance criteria must be included in procurement documents.

7.1.2 *Procurement of Services*

Procurement of quality-related contractors such as laboratory or engineering design may include adoption of the contractor's quality assurance program.

7.1.3 *Requisition*

The technical, quality, regulatory, and administrative requirements applicable to procurement of materials for the Cimarron Site are established by the requisitioner and specified in the purchase requisition.

Material potentially affecting quality must not be requisitioned until it is determined that the supplier can ensure an appropriate level of quality. Depending on the nature of the material, the procurement process may include requiring evidence of the supplier's quality assurance program, third party audits, assessments, or certifications of the supplier's capabilities. When this evidence is required, it will be reviewed by the QAC or designee. Satisfactory review of the supplier's documentation (and a physical audit of the supplier's facilities, if appropriate) will be documented and records will be maintained in the document repository (reference Section 12.0 of this QAPP).

If a procured material is an "off the shelf" item of commercial grade, but has performance characteristics deemed important to quality, those characteristics must be specifically listed on the requisition. The requisitioner will also note on the requisition whether receipt inspection or testing is required prior to acceptance of the item (inspection should be required at a minimum to verify that quality requirements established by the purchase requisition have been met). Cut sheets or specifications used to select the item, and any specifications or instructions delivered with the equipment, should become part of the procurement file and distributed to the end user as necessary.

7.1.4 *Vendor Qualifications*

Vendors are qualified on an as-needed basis when products or services are required to complete quality related work. Qualification may be based on the vendors submitted statement of qualifications, third party audits, reference referrals, professional certifications or licensure, or by the review of other information deemed relevant to establish the vendor's qualifications to perform a required scope of work. This may include contract-related requirements (e.g. required minimum insurance or EMR rating).

Once completed, a record of vendor qualification is maintained by the QAC. Vendor qualification records are maintained electronically in a central location.

A Trustee representative may access vendor facilities to perform assessments and inspections. Specific procurement requirements established by the requisitioner may also require the vendor to submit documentation and records that demonstrate the acceptability of the service or equipment provided.

7.1.5 *Periodic Vendor Assessment*

Each approved vendor's performance is assessed periodically to maintain the vendor's qualification status. Documented vendor reviews are valid for up to three years.

Assessments of the vendors may include reviewing assessment reports conducted by regulatory agencies or other customers. Internally, the assessment maybe based on vendor performance, or by physical audit or receipt of a vendor performance questionnaire. Approved vendors may also be re-evaluated when:

- A vendor's performance is considered unacceptable by the Trustee PM or QAC.
- At the discretion of the Trustee PM or QAC, based on a trend of non-conformances, prolonged periods of inactivity, or significant and documented problems with other clients or regulators.
- At the discretion of the Trustee PM or QAC, vendors whose performance is unacceptable may be disqualified or maintained on hold pending successful implementation of corrective action.

7.2 Inspection of Materials, Equipment, and Parts (Items)

The level of inspection required for an item is specified in procurement documents or an Activity Plan. The QAPP does not establish specific inspection or assessment requirements or frequencies, but all items at the Site are subject to inspection or assessment by the Trustee PM or QAC (or personnel designated by either individual).

Acceptance requirements for inspection, or for test records that verify that an item is acceptable, must be clearly stated in procurement documents. A vendor may provide the required documentation, or independent inspections may be performed to verify conformance with procurement requirements. When inspection evaluates conformance of an item to specified requirements, the inspection must be documented. Inspection records contain at a minimum, the item inspected, date of inspection, inspector, type of observation, results, and either acceptability or, if not acceptable, a description of its nonconformance.

7.3 Control of Materials

Control of quality critical materials is required. These materials include, but are not limited to, resin and chemicals used in the remediation process, partially processed and processed resin and/or biomass, contaminated equipment or waste, and contaminated material being stored prior to shipping.

Where possible, quality critical materials must be properly labeled and easily identifiable. The status of such materials must be designated. For instance, spent resin must be identified as such and must be segregated from unused resin to prevent its misuse. Drums of dewatered biomass that has not yet been blended with absorbent must be identified as such so it is not stored for shipment prior to blending.

Additionally, all materials should be stored properly in designated locations appropriate for that material. Storage areas should be clearly demarcated and labeled to prevent inadvertent misplacement and/or misuse of quality critical materials.

8.0 SAMPLING, ANALYSES, MEASUREMENTS, AND PROCESSES

The purpose of this section is to provide quality requirements for control of sampling, analyses, measurements, and processes. Monitoring for compliance with these quality requirements may be conducted at any time by the QAC (or designee).

8.1 Radiation Protection

Radiation control requirements are included in the Radiation Protection Program.

8.2 Quality Control in Environmental Sampling

The quality requirements (i.e. sample masses, flow rates, or volumes) for instruments or containers used for environmental sampling of solids, liquids, or gases will be determined in design and specified in design documents, applicable Sampling and Analysis Procedure(s), and/or Activity Plans.

8.3 Quality Control for Effluent Monitoring Systems

Quality control procedures for effluent monitoring systems shall address the following, as applicable:

- The frequency of duplicates and replicates should be established based on time (for continuous discharges) or number of batches (for batch discharges).
- Sample integrity should be maintained through chain of custody procedures.
- Procedures for continuous sampling should use methods that are designed to ensure that the sample is representative of the volumes being discharged.
- Sampling should be performed using calibrated instruments and equipment when taking a composite sample.

- Collection efficiencies based on the physical configuration of the sampling point and the type of collector should be documented. Vendor-supplied data may be used where adequate documentation exists to ensure the reliability and accuracy of data.
- Volumes of tanks and containers should be established during initial installation and should be verified again following any physical changes that could alter the system configuration.

8.4 Laboratory Quality Control

Laboratories used by the Trustee will be subject to vendor qualification requirements provided in Section 7.0 of the QAPP.

Analytical laboratory qualifications will include the following:

- Quality Assurance Program approved by the QAC
- Accreditation by the Oklahoma Department of Environmental Quality
- Certification by National Environmental Laboratory Accreditation Program (NELAP) (or equivalent)

Quality requirements for other laboratories, such as instrument calibration or dosimetry, will be determined by the RSO.

8.4.1 *Verification and Validation (V&V)*

The V&V of certain aspects and support activities related to radiological or environmental measurements monitoring are essential to the QA program.

- V&V requirements for standard analytical methods will be included in the contracted analytical laboratory's Quality Assurance Program.

- V&V requirements for non-standard on-site measurements will be determined by the Trustee PM and QAC.

8.5 Construction Quality Control

Construction quality will be controlled using the three-phase quality system described below. The purpose of the three-phase system is to require the contractor to plan and schedule special process work to ensure that he is prepared to start each definable feature of work.

8.5.1 *Construction Submittals*

Submittals are required by the contractor to regulate the timely flow of materials to be incorporated into construction work. They are necessary to demonstrate that the proposed materials, etc., follow the drawings and specifications. All required submittals must be submitted by the contractor in time to allow for the review, approval, procurement, delivery, and performance of the preparatory phase of the Three Phases of Control for an item before it is needed for construction.

First Phase – Pre-Construction Meeting

The Pre-Construction Meeting will be performed prior to any construction work, as determined by the EPM Project Manager or the QAC. The following topics will be reviewed:

- Contract plans and specifications.
- Status of submittal approvals.
- Physical examination of materials.
- Status of preliminary work.
- Procedure/plan for accomplishing work.

- Safety hazard assessment.
- Radiation protection assessment.
- Testing – number of tests; when; where; and nature of recording.
- Identify individuals with QA/QC responsibility.

Second Phase – Initial Inspection

The Initial Inspection will be conducted at the beginning of any phase of construction work and will include the following:

- Check preliminary work (e.g. from previous phase) – verify full compliance.
- Establish level of workmanship.
- Resolve all differences.
- Check safety compliance.
- Check radiation protection compliance.

Third Phase – Follow-up Inspections

Follow-up inspections will be performed daily to ensure that controls continue to provide work which conforms to the drawings and specifications.

8.5.2 *Documentation of Construction Controls*

All construction quality control activities will be documented as follows:

- Submittals will be classified as: Approved; Approved, except as noted; or Disapproved;
- Pre-Construction Meetings will be documented with an agenda and meeting minutes.

- Initial Inspections will be documented on the Daily Construction Quality Control Form.
- Follow-up inspections will be documented on the Daily Construction Quality Control Form.

8.6 Process Control

The Cimarron remediation system – consisting of groundwater extraction, treatment, and injection systems – will be equipped with a fully-integrated control system providing continuous automated operation under normal conditions. The control system will provide the permissives, trips, and interlocks, along with appropriate redundancies, necessary for safe and reliable operation. Programmable logic controllers (PLCs) will process inputs associated with process instrumentation, equipment status signals, operator commands, and other data sources. The PLCs will also execute automated and manual process commands using analog control loops and binary control functions, in accordance with the control logic established by PLC software programming. Critical interlocks and other functions will be executed via hardwired connection and/or failsafe hardware configurations. A single PLC located in the Western Area Treatment Facility (WATF) control room will serve as the Balance of Plant (BOP) controller, with other PLCs located on self-contained equipment skids serving as distributed process controllers. These PLCs will be subordinate to the BOP controller but will be capable of safely operating their respective processes independently. A PLC located in the Western Area (WA) well field will serve as remote terminal unit, routing data and control commands to and from select groundwater extraction wells and the BOP controller. The PLCs will also execute alarm functions and collect data for logging purposes. All operational data will be transmitted back to the BOP controller for logging via a central database consisting of a server equipped with a historian software package.

The control system will include human-machine interfaces (HMIs) in the WATF control room and select equipment skid locations to facilitate operator command execution and display the status of process control operators and alarms. The HMIs will also display key operational data. The central (BOP) HMI will provide a geospatial display of well field operational information for both the WA and Burial Area #1 (BA1) systems. The BOP HMI will consist of a computer workstation with panel monitors while the remote HMIs will consist of touchscreen thin clients. The control system will include remote telemetry providing alarm notification (via text message) and acknowledgement capability (via web-based interface). The web-based interface will also provide remote monitoring, control, and data download capabilities. Local and remote access to the control system will be managed via password-protected permissions established for various personnel roles and access levels.

8.7 Data Quality Control

Data quality control typically applies to off-site testing of samples, material, etc. However, data quality control may also apply to the on-site generation of data, or installation of equipment. Control of tests will be included in Sampling and Analysis Procedures and Activity Plans, or other quality control documents.

Requirements for off-site laboratories are discussed in Section 8.4 above.

8.7.1 *On-site Data*

Two main categories of laboratory analytical data are collected at the Site: geotechnical and chemical/radiological. Geotechnical data, when received, is stored in the electronic data repository (EDR).

Chemical/radiological data may receive two types of review following receipt. The first is a standard data review of analytical results. The second, as applicable, is a "reasonableness" review consisting of comparison with historical results from the same location (if applicable). For radiological analytical data, reasonableness review may also consist of comparison with other laboratory analytical results. For example, isotopic concentration data may be compared to isotopic activity to evaluate data acceptability.

Following review, analytical data is uploaded to an EQuIS database. Review-assigned data qualifiers are manually entered in addition to laboratory-assigned data qualifiers.

8.7.2 *Geodetic Data*

Geodetic data is collected by a licensed surveyor. New data points should tie in with existing locations, as determined by the licensed surveyor. For example, a survey of new monitoring wells should include surveys for one or more existing monitoring wells. New survey data is included in the Electronic Data Repository (EDR). A monitoring well inventory and the ArcGIS database are updated based on the new data in the EDR.

8.7.3 *Radiological Survey Data*

Radiological survey data collected on site is managed in accordance with the Cimarron Radiation Protection Program. Electronic copies of radiological survey forms are maintained on the site computer and are uploaded monthly to the EDR. Paper copies are maintained on site.

8.7.4 *Field Measurements*

Field measurements collected on site include ground water sampling field parameters and lithologic data obtained during drilling operations. Ground water field parameters are

recorded on field parameter forms. Where applicable, all field parameters are collected with instruments that are calibrated daily during field work. Boring logs and monitoring well completion diagrams are prepared by task-qualified personnel who are familiar with Site geology.

8.7.5 *Other Test Data*

All other test data, such as equipment installation or construction materials installation, will be managed as described above and determined by the EPM Project Manager or QAC.

9.0 CONTROL OF MEASURING AND TEST EQUIPMENT

The purpose of this section is to assure that tools, gauges, instruments, and other measuring and testing devices used in activities affecting quality are properly controlled, calibrated, and adjusted at specified periods to maintain accuracy within necessary limits.

Types of measuring and test equipment may include radiological instruments, groundwater level measurement gauges, and field chemical measurement equipment, as well as groundwater treatment system gauges and controls.

Details regarding controls for the groundwater extraction and treatment system are included in Section 8.0 of the Decommissioning Plan and summarized as follows:

The Cimarron remediation system – consisting of groundwater extraction, treatment, and injection systems – will be equipped with a fully-integrated control system providing continuous automated operation under normal conditions. The control system will provide the permissives, trips, and interlocks, along with appropriate redundancies, necessary for safe and reliable operation. Programmable logic controllers (PLCs) will process inputs associated with process instrumentation, equipment status signals, operator commands, and other data sources. The PLCs will also execute automated and manual process commands using analog control loops and binary control functions, in accordance with the control logic established by PLC software programming. Critical interlocks and other functions will be executed via hardwired connection and/or failsafe hardware configurations. A single PLC located in the Western Area Treatment Facility (WATF) control room will serve as the Balance of Plant (BOP) controller, with other PLCs located on self-contained equipment skids serving as distributed process controllers. These PLCs will be subordinate to the BOP controller but will be capable of safely operating their respective processes independently. A PLC located in the Western Area (WA)

well field will serve as remote terminal unit, routing data and control commands to and from select groundwater extraction wells and the BOP controller. The PLCs will also execute alarm functions and collect data for logging purposes. All operational data will be transmitted back to the BOP controller for logging via a central database consisting of a server equipped with a historian software package.

The control system will include human-machine interfaces (HMIs) in the WATF control room and select equipment skid locations to facilitate operator command execution and display the status of process control operators and alarms. The HMIs will also display key operational data. The central (BOP) HMI will provide a geospatial display of well field operational information for both the WA and Burial Area #1 (BA1) systems. The BOP HMI will consist of a computer workstation with panel monitors while the remote HMIs will consist of touchscreen thin clients. The control system will include remote telemetry providing alarm notification (via text message) and acknowledgement capability (via web-based interface). The web-based interface will also provide remote monitoring, control, and data download capabilities.

Local and remote access to the control system will be managed via password-protected permissions established for various personnel roles and access levels.

Plant operations will be documented on daily logs.

9.1 Calibration

Measuring and test equipment requiring calibration must not be used unless the calibration is current. Plans, procedures, and/or designs require verification and documentation of calibration.

Frequency of equipment calibration shall be in accordance with applicable procedures and instructions, as well as manufacturer's recommendations. Daily calibration checks shall be in

accordance with applicable procedures and instructions, as well as manufacturer's recommendations.

Further requirements for calibration and control of radiological instrumentation are provided in the Radiation Protection Program.

The adequacy of supplier controls on measuring and test equipment is subject to assessment.

9.2 Adjustment

Calibrated measuring and test equipment, subject to operation checks, may be adjusted by qualified personnel in accordance with Desk Instructions or other procedures.

9.3 Equipment Inventory

Equipment which impacts Quality Activities or Quality Data (e.g. calibrated instruments) must be marked with a unique identifier, such as a serial number. An inventory of equipment owned or controlled by the Trustee must be maintained on site, along with records of calibration.

9.4 Out-of-service Equipment

When equipment is found to need calibration or repair, it must be taken out of service. Out-of-service equipment must be visibly marked (i.e. tagged) and physically separated from in service equipment. If the equipment is owned or controlled by the Trustee, the equipment inventory must be updated to reflect the status of the equipment and to maintain control of its use.

10.0 HANDLING, STORAGE, AND SHIPPING

The purpose of this section is to establish measures to control the handling, storage, shipping, cleaning and preservation of material and equipment in accordance with procedures and instructions to prevent damage or deterioration.

Handling, storage, and shipping activities also includes the proper containerization, preservation, and shipping of environmental samples for analysis. These efforts are controlled through detailed work instructions in plans or procedures.

Qualified contractors and/or subcontractors will provide handling, storage and shipping services for low level radioactive waste (LLRW), contaminated materials, and some solid waste. Such contractors and/or subcontractors will be qualified as described in Section 7.0 of this QAPP.

Contaminated materials being shipped for disposal must comply with DOT regulations and Disposal Facility Waste Acceptance Criteria (WAC). Manifests, and/or bills of lading must document the appropriate packaging and transportation of such materials. A QAIP will be developed to provide instruction for classification and shipping papers for LLRW.

Handling and storage requirements also apply to materials which possess hazardous characteristics, or which have specific requirements for their handling or storage. For instance, flammable materials must be stored in fire-rated vented cabinets, and liquids which may spontaneously produce vapors may require the use of personnel protective equipment. Materials requiring special handling and/or storage requirements will be identified and labeled, and procedures or other instructions for their handling and/or storage must specify those requirements.

11.0 CONTROL OF NONCONFORMING ITEMS AND EQUIPMENT

Section 9.0 above describes measures to assure that tools, gages, instruments, and other measuring and testing devices used in activities affecting quality are properly controlled, calibrated, and adjusted at specified periods to maintain accuracy within necessary limits.

When items or equipment are evaluated and determined not to comply with quality requirements, they are designated as “nonconforming”. Nonconforming items or equipment will be controlled to prevent inadvertent installation or use by labeling, tagging, and/or isolation.

When procedures are not property followed, that incorrect “performance” is considered a nonconformance. When errors are identified in documentation, those documents are considered nonconforming.

A nonconformance is defined as any deficiency in characteristic, documentation, performance, or documentation that renders the quality of an item or deliverable unacceptable or indeterminate. This includes data that is considered deficient or suspect through failure of sampling, analysis, or data processing procedures.

When any non-conformance affecting quality is identified, the non-conformance shall be documented on the Notice of Deficiency form. Section 14.0 provides requirements for corrective actions regarding identified program deficiencies. An example of a deficiency would be the inadvertent use of nonconforming equipment.

12.0 DOCUMENTS AND RECORDS

This QAPP requires maintenance of a system that produces unequivocal, accurate records that document all monitoring and quality related activities. The purpose of this section is to provide quality requirements for the management of Project records and documents.

The Trustee PM is responsible for the maintenance of quality records relevant to license termination and site closure. Quality records include any documentation of activity that produces data or otherwise supports decisions related to license termination and site closure.

Quality records also include records of personnel qualification, training, and radiation exposure. Records fitting this description are classed as Lifetime Records, and must be maintained for until license termination, except that the retention for exposure records is indefinite.

12.1 Quality Assurance Records

A system that produces unequivocal, accurate records that document all monitoring activities will be maintained. Records of implementation or ongoing activities will be maintained, such as the following:

- Plan or procedure revision
- Deficiency Reports and Corrective Actions
- QA Inspections, Assessments, Surveillances, and Audits
- Completed Activity Plans
- Personnel training and qualification records
- Reports of analytical results
- Procurement documents containing quality requirements and specifications, including laboratory analytical services

- Formal Regulatory Communications, Submittals, Permits, License documents
- Equipment Inventory and Calibration Records
- Uranium Inventory Logs
- Accident Reports
- Corrective actions
- Intermediate activities or calculations (as may be needed to validate or substantiate results)
- Records of tracking and control (chain of custody) throughout all processes from sample collection through analysis and reporting of results, including unique identifiers, descriptions, sources, dates/times, packaging/preparation/shipping, and required analyses
- Field logs with sufficient information describing environmental conditions and recording related information and data documenting the nature of the sample and where and how it was taken
- Laboratory notebooks recording related information and data, observations of analysts, and laboratory or other conditions potentially affecting the measurement process
- Electronic data collection and algorithms and QA documentation
- Calculations (including data reduction, analysis, and verification)
- Other records as determined by the Trustee PM or QAC

12.1.1 *Records of Analytical Data*

Data obtained from laboratory analysis of collected samples affects decisions related to license termination and site closure. The control and archiving of this data is implemented through the Cimarron Data Management Procedure. The procedure

establishes standards for electronic data deliverable (EDD) formats from the laboratory, and for data archiving. Reference the Data Management Procedure

12.2 Quality Assurance Documents

The latest (i.e. current) version of a plan, procedure, or instruction which stipulate requirements which must be met, or which address Quality Activities are considered Quality Assurance (QA) Documents. Quality Assurance Documents are developed, when required, by Subject Matter Experts, as delegated by the Trustee PM. The Trustee PM will coordinate distribution of QA Documents.

Documents are also "records".

12.3 Document Control

Documents specifically required to be controlled by this QAPP include:

- The Quality Assurance Program Plan and implementing procedures
- Radiation Protection Plan and implementing procedures
- Sampling and Analysis Plan and implementing procedures
- Health and Safety Plan and implementing procedures
- Standard operating procedures
- Activity Plans
- Other documents as determined by the Trustee PM or QAC

The necessity for revisions to QA Documents will be determined by Subject Matter Experts with concurrence of the Trustee PM. Where applicable, revisions to the QAPP will managed in accordance with License Condition 27(e). Logs of current revisions for plans, procedures, and instructions will be maintained.

End users are required to verify with the Trustee PM or QAC that the latest approved version of a document is used.

Users rely on the revision number on the cover page of the controlled document to verify their printed version. Consequently, revision of individual pages within a document are not permitted. As a good practice, document revisions should be announced to likely users when they become available and the previous version will be "retired".

12.4 Document and Record Storage

12.4.1 *Hard Copies of Controlled Documents*

A single hardcopy of controlled documents will be maintained at the Cimarron Site.

12.4.2 *Electronic Copies of Controlled Documents*

Electronic copies of controlled documents are maintained on a SharePoint site with limited access as determined by the Trustee. Editable versions of electronic documents are electronically stored with limited access as determined by the Trustee PM and the QAC.

12.4.3 *Master Document Repository*

The master document repository contains electronic copies of documents. The repository is maintained in a central location; files are in .pdf format so the document cannot be inadvertently changed by a user. An electronic copy of each controlled document must be stored in the master document repository.

12.4.4 *Retired Documents*

Retired documents will be removed from the SharePoint site and moved to the master document repository.

12.4.5 *Redundant Storage*

Redundant storage of records is required. This can take the form of remote electronic storage combined with onsite hardcopy storage. Records that do not need to be immediately accessible may be archived for storage at a remote location as determined by the Trustee PM or QAC.

13.0 AUDITS AND ASSESSMENTS

Assessments and audits will be used to evaluate the effectiveness of the Cimarron Quality Assurance Program. The Quality Assurance Coordinator (QAC) is responsible for the planning and execution of internal and external audits and assessments for the CERT Trustee. Subject to approval by the QAC, audits may be requested by the Trustee Project Manager, Subject Matter Experts, or RSO.

13.1 Audits and Surveillances

Planned and periodic audits will be conducted to verify compliance and determine effectiveness of the entire Quality Assurance Program. The Trustee PM or the QAC will perform or schedule an audit of the Quality Assurance Program at least once every three years.

Annual audit of the Radiation Protection Program will be conducted by the QAC, as required by the Radiation Protection Plan, and will be in accordance with NUREG-1556, Vol. 7, Appendix L. Radiation Protection Surveillances may be initiated by the RSO or Quality Assurance Coordinator.

Procedure for audits are in general accordance with NQA-1, and an audit report is issued to the Trustee PM (for internal audits) or to the supplier quality representative. The report will be transmitted with a request to identify corrective actions for reported findings.

The QAC will schedule a return visit or review documentation to verify corrective actions are complete, after which the audit is closed out. Desk-top audits may be substituted for on-site audits depending on the complexity of the products and services being supplied.

Third party audits or independent certifications may also be reviewed in lieu of direct auditing.

Follow-up to deficiencies noted in audit and surveillances, and trending/tracking, shall be managed in accordance with Section 14.0 below.

13.2 Assessments

Management (above or outside the QA organization) will regularly assess the scope, status, adequacy, and compliance of the QA program. This will include formal triennial reviews.

13.3 Audit Records

Audit records shall include documentation in conformance with NQA-1, where applicable. Management of audit records shall be in accordance with Section 12.0 above.

14.0 CORRECTIVE ACTIONS

Integral components of the Cimarron QA program include audits, surveillances, or assessments to identify areas for improvement, define performance or programmatic deficiencies, and initiate appropriate corrective or preventive actions (i.e. follow-up).

14.1 Notice of Deficiency

Corrective action for non-conformances and incidents is implemented through the "Notice of Deficiency" reporting process. The Notice of Deficiency (NOD) is used to report conditions adverse to safety, and to report accidents that occur. NODs document stop-work actions initiated by anyone working at the Site, deficiencies in procured items or services, documents, procedure content, or adherence to procedures in the performance of work. NODs document failure to comply with specified requirements.

The adoption of this single reporting mechanism simplifies deficiency reporting and the resolution of issues that impact quality at the site.

This process provides for the prompt identification of conditions adverse to quality, determination of their cause, resolution of the specific conditions adverse to quality, and follow-up. A log of deficiencies and corrective actions is maintained to permit trending analysis if appropriate. The trend analysis can be used to identify timely corrective actions to prevent recurring problems and improve performance, as well as determine effectiveness of the corrective action and need for follow-up. Deficiency reporting and documentation of the corrective action process are controlled by QA Procedure QAIP 15.1.