ANNEX A

CIMARRON CORPORATION

RADIATION PROTECTION

PLAN

for
Cimarron Corporation former Nuclear Fuels Fabrication Facility
near Crescent, OK

Table of Contents

List of Protection Plan Section Revisions

SECTION		Issued:	Revision No.
1.0	Introduction	April 27, 2002	Revision 3
2.0	General Information	April 27, 2002	Revision 3
3.0	Administration	December 4, 2002	Revision 4
4.0	ALARA Program	April 27, 2002	Revision 3
5.0	Assessments	April 27, 2002	Revision 3
6.0	Personnel Monitoring	April 27, 2002	Revision 3
7.0	Radiation Protection Instrumentation	April 27, 2002	Revision 3
8.0	Access Control	April 27, 2002	Revision 3
9.0	Special Work Permits	April 27, 2002	Revision 3
10.0	Radiation Protection Surveys	April 27, 2002	Revision 3
11.0	Radioactive Materials Control	April 27, 2002	Revision 3
12.0	Contamination Control	April 27, 2002	Revision 3
13.0	Unconditional Release of Materials	April 27, 2002	Revision 3
14.0	Respiratory Protection	April 27, 2002	Revision 3
15.0	Environmental Monitoring	Sept. 17, 2002	Revision 4

1.0 INTRODUCTION

1.1 Section Overview

This introductory section to the Cimarron Radiation Protection Plan (Plan) is intended as an orientation to the overall purpose and scope of the Plan.

1.2 Purpose

The purpose of the Plan is to summarize the regulations and safety practices that apply to the radiological operations of Cimarron Corporation (Cimarron) and to establish Cimarron radiation protection policies. From these policies, specific procedures are developed to assure compliance with regulations and to maintain radiation exposures, resulting from decommissioning and related operations, to a level that is as low as is reasonably achievable (ALARA). Cimarron Corporation shall comply with all applicable state and federal regulations, licenses, and permits during the decommissioning process.

This Plan was initially developed in response to NRC comments (dated August 16, 1996) regarding the Cimarron License SNM-928 amendment request dated November 15, 1994. This Plan, otherwise known as Annex A to License SNM-928 supercedes the original Appendix A/Annex A in License Amendment #13.

The policies stated in this Plan are not intended to restrict Cimarron operations more than required by regulations. Wherever a policy is more restrictive than the regulations, the policy is intended only as a practical means of achieving regulatory compliance. Unintentional or approved intentional variations from the policies established in this Plan and applicable procedures shall not be construed as a violation of the Cimarron radioactive material license as long as regulatory compliance is achieved. All operational variations to the Plan shall be approved by the Radiation Safety Officer (RSO) in writing.

This Radiation Protection Plan (Annex A) shall be reviewed at least annually by the ALARA Committee. The review will assess the effectiveness of the Plan in providing appropriate regulatory and radiation protection policy. The review will be documented and changes to the Plan will be made based upon the recommendations of the ALARA Committee.

1.3 Scope

The policies in this Plan apply to all routine and emergency radiological operations. All Cimarron Corporation employees, contractors, and visitors are included within the scope of the policies in this Plan.

2.0 GENERAL INFORMATION

2.1 Section Overview

This section provides requirements for radiation safety definitions, gives the responsibilities of those involved in Cimarron Corporation radiological operations, and discusses radiation safety training requirements.

2.2 Definitions

Definitions are required to ensure that individuals understand the requirements of the regulations and the Radiation Protection Program at Cimarron Corporation. Cimarron Corporation shall utilize regulatory definitions whenever possible, or may use definitions that are more restrictive than the regulatory definition. In addition, Cimarron Corporation uses definitions which are consistent with standard industry guideline documents.

2.3 Responsibilities

Cimarron Corporation shall incorporate clearly defined responsibilities in the Radiation Protection Program. Each individual at Cimarron shares responsibility for their own radiation protection as well as for their co-workers and individual members of the public. Key responsibilities under the Radiation Protection Program are outlined below. Job specific responsibilities under the Radiation Protection Program shall be outlined in the Radiation Protection Program Procedures.

The Vice President , Cimarron Corporation has ultimate responsibility for assuring that the Radiation Protection Plan at Cimarron Corporation is developed and implemented in a manner consistent with regulatory requirements and company policies. This responsibility is delegated to the Radiation Safety Officer.

The Manager of Planning and Regulatory Compliance, here out known as Site Manager, is responsible for assuring that resources are allocated to the radiation protection program, that coordination between Supervisory personnel occurs, and that an effective response capability for emergency issues dealing with radioactive materials is maintained. The Site Manager also has authority to stop work in the event that the health and safety of workers or members of the public may be compromised or if regulatory non-compliance may occur.

The ALARA Committee is responsible for reviewing, evaluating and approving the Radiation Protection Plan and changes to the plan in accordance with License Condition 27(e), reviewing operations dealing with radioactive materials and radiological controls, and providing direction to the Radiation Safety Officer for

decisions involving ALARA, methods of operations, and approving annual ALARA goals for the Cimarron Facility.

The Radiation Safety Officer (RSO) is responsible for development, implementation, and oversight of the Radiation Protection Program. The RSO chairs the ALARA Committee and is responsible for bringing pertinent radiation protection and safety issues to the attention of the ALARA Committee. The RSO has authority to stop work in the event that the health and safety of workers or members of the public may be compromised or if regulatory non-compliance may occur.

The Quality Assurance Coordinator is responsible for assessments of the radiation protection program, for the maintenance and distribution of controlled documents, and for long-term storage of quality assurance documents after they are no longer required for operational purposes. The QA Coordinator has authority to stop work in the event that the health and safety of workers or members of the public may be compromised or if regulatory non-compliance may occur.

Each Supervisor is responsible for the effective implementation of radiation protection procedures within their scope of activities. Each Supervisor has authority to stop work in the event that the health and safety of workers or members of the public may be compromised or if regulatory non-compliance may occur.

Each employee at Cimarron Corporation is responsible for following regulatory requirements and Cimarron Corporation radiation protection procedures to the best of his/her ability and knowledge. These responsibilities include proper use of protective and personnel monitoring equipment, notifying management of any potential or real radiation hazards or improper practices, and maintaining his/her individual radiation exposure and that of others ALARA. All Cimarron Corporation employees should be aware of and heed the instructions on the "Notice to Employees" (NRC Form 3). Employees are subject to reprimand and possible discharge from the Company for activities deemed to be in violation of Company policy or regulatory requirements.

Employees are requested to contact management first regarding potential regulatory or license violations before contacting regulatory agencies. However, any employee who is not satisfied with the management response regarding the potential violation is encouraged to contact the regulatory agency for resolution of the concern.

2.4 Training Requirements and Policy

All persons who are permitted to enter the Cimarron Corporation restricted area shall receive information and training in radiation safety. The depth of the training will be commensurate with the potential radiation safety problems and will be in compliance with the requirements in 10 CFR 19 and 10 CFR 20. Cimarron may have several levels of training, such as visitor, escorted radiation worker, radiation worker, and health physics technician training. Each of the levels of training will ensure that individuals are:

- Aware that radioactive materials are present in the restricted areas;
- Informed regarding additional risks that may arise due to the anticipated exposure of the individual;
- Informed regarding precautions or procedures to minimize exposure to radioactive materials or radiation;
- Informed of the purpose and functions of protective devices and monitoring devices that will be used; and
- Informed regarding additional protection available for the embryo/fetus, as applicable.

Training for workers will include:

- Applicable provisions of the regulations and licenses for the protection of personnel from exposure to radiation or radioactive materials;
- Responsibility of the worker to report promptly to Cimarron Corporation any conditions that may lead to or cause a violation of regulations or licenses or unnecessary exposure to radioactive material or radiation.
- Appropriate responses to warnings made in the event of any unusual occurrence or malfunction that may involve exposure to radiation or radioactive material; and
- Radiation exposure reports that may be requested by the worker pursuant to the regulations.

The Radiation Safety Officer is responsible for training of workers. Visitor training requirements are approved by the RSO, but may be administered by radiation workers.

The Cimarron Corporation training program should meet these requirements by using any of the following techniques: Classroom training videotapes, reading assignments, on-the-job training, demonstrations, drills, and discussions. Cimarron Corporation radiation workers attend an appropriate classroom training session upon employment and receive periodic review training at least annually. Training records for all individuals shall be maintained in accordance with Quality Assurance Plan.

3.0 ADMINISTRATION

3.1 Section Overview

This section describes the administration of Cimarron Corporation's Radiation Protection Program. Administration of the Radiation Protection Program requires coordination between the Radiation Safety Officer, Site Manager, Quality Assurance Coordinator, Supervisors, the ALARA Committee, and workers. Organization and staffing requirements of the Radiation Protection organization are presented, as well as the requirements of the ALARA Committee. Relationships between documents used to achieve compliance with the regulations and Cimarron Corporation's radioactive materials licenses are presented.

Compliance with the Radiation Protection Program policies is achieved through the implementation of procedures. Requirements for the development, review, approval, and control of procedures are also provided.

The Radiation Protection Program results in the generation of documents and records. In addition, notifications and reports are required by the regulations. Requirements for proper generation, storage, and turnover of documents and notifications are described to ensure regulatory compliance.

3.2 Radiation Protection Organization

The current organizational structure for Cimarron Corporation, including relationships between Cimarron Corporation and Kerr-McGee Corporation, is presented in Figure 3-1. Changes to the Radiation Protection Organization require the approval of the Site Manager. Radiation Protection staffing levels should be periodically reviewed by the Site Manager and Radiation Safety Officer to ensure that adequate staffing levels are maintained which are consistent with current and planned activities. Duties and responsibilities that are required for each health physics procedure shall be clearly defined.

3.3 Radiation Protection Program Document Hierarchy

Hierarchy of the Radiation Protection Program documents shall be as follows:

Federal and State Regulations (e.g.,10 CFR)

Radioactive Materials Licenses and Permits issued by the Nuclear Regulatory Commission, other Federal offices, and the State of Oklahoma, including all documents incorporated by reference, such as the Cimarron Corporation Radiation Protection Plan.

Radiation Protection Program Procedures. These procedures shall administer and implement the Cimarron Radiation Protection Plan.

3.4 Radiation Protection Program Manuals

The Radiation Protection Program shall be specifically defined and implemented using administrative and/or implementing procedures. Administrative procedures contain the policies, regulatory requirements, and administrative guidelines that will be used in the Radiation Protection Program. Implementing procedures contain specific information for achieving the requirements found in the Radiation Protection Plan or in the administrative procedures.

3.5 Procedure Development

Radiation Protection Program Procedures shall be developed in accordance with the Cimarron Corporation Quality Assurance Plan. In addition, procedures shall be prepared in accordance with regulatory requirements and the Cimarron Corporation Radiation Protection Plan and should incorporate applicable technical guidance documents (e.g., ICRP, NCRP, U.S. NRC Regulatory Guides, ANSI Standards, ASME Standards, etc.).

3.6 Procedure Review, Approval, and Control

Procedures shall undergo technical verification and review to ensure compliance with regulatory requirements, all applicable licenses and permits, the Cimarron Corporation Radiation Protection Plan, and conformance, to the extent practicable, with applicable technical guidance documents. Procedure review shall also assure compatibility with all other Cimarron Corporation procedure manuals and documents. Reviews shall ensure that the procedure can be performed as written and that responsibilities are clearly defined and consistent with position descriptions. Review of procedures shall be performed by the Quality Assurance Coordinator, and the Radiation Safety Officer. All Radiation Protection Program procedures shall be approved by the Radiation Safety Officer. Procedures shall be issued and controlled by the Quality Assurance Coordinator in accordance with the Quality Assurance Plan.

3.7 Radiation Protection Program Documentation

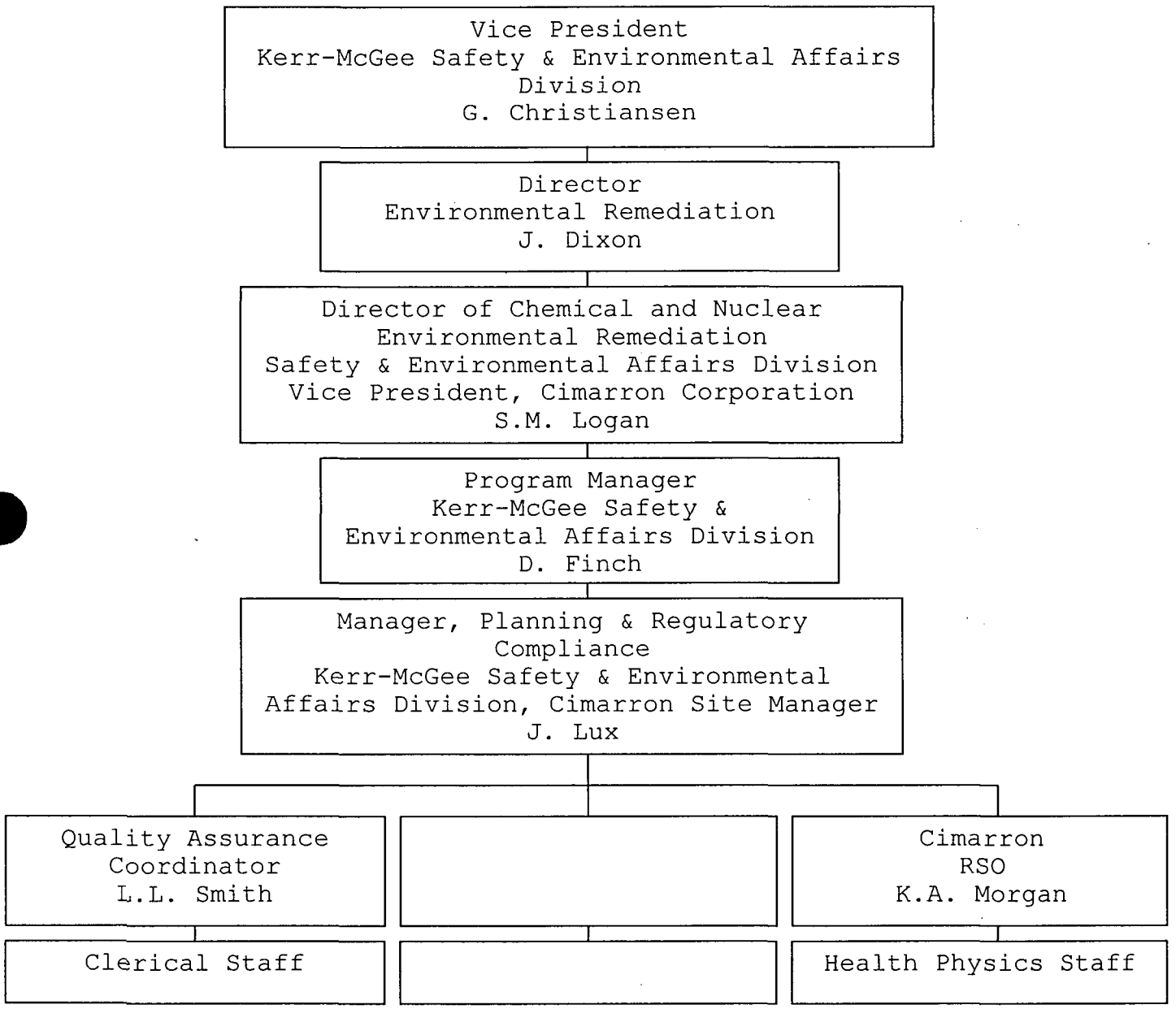
Implementation of the Radiation Protection Program results in generation of documents demonstrating the quality of services performed and compliance with federal and state regulations. Radiation Protection documents shall be controlled in accordance with regulatory requirements and the requirements of the Cimarron Corporation Quality Assurance Plan.

3.8 Notifications and Reports

Notifications and reports shall be made in accordance with the requirements of 10 CFR 19, 10 CFR 20, 10 CFR 21, and 10 CFR 70.

Figure 3-1

Kerr-Mcgee Corporation
Safety & Environmental Affairs Division
(Cimarron)



4.0 ALARA PROGRAM

4.1 Section Overview

Regulations in 10 CFR 20 require that Cimarron develop, document, and implement a radiation protection program commensurate with the scope and extent of licensed activities. In addition, the regulations require Cimarron to use, to the extent practicable, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are as low as is reasonably achievable. In order to comply with the regulations and to ensure a safe and healthy environment for workers and members of the public, Cimarron operations shall be performed in a manner such that doses are maintained ALARA.

4.2 ALARA Policy

Cimarron Corporation operations shall be performed in a manner such that doses are maintained As Low As is Reasonably Achievable (ALARA). The basic philosophy of radiation protection is to maintain radiation exposures ALARA below the regulatory requirements. "Reasonable" means that the costs, benefits, and risks are considered in trying to minimize dose.

In accordance with the Code of Federal Regulations, Cimarron Corporation has developed, documented, and implemented a radiation protection program commensurate with the scope and extent of licensed activities. The Cimarron Radiation Protection Program embraces the ALARA philosophy through its use, to the extent practicable, of procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are ALARA. Cimarron is committed to providing all necessary resources, in the form of personnel, training, engineering controls, preparation and planning, design, equipment, monitoring devices, and controls to achieve ALARA doses at its facility.

Each employee is expected to be knowledgeable of work activities, and to abide by all ALARA requirements such as those found on Special Work Permits. In addition to the responsibility for their own dose minimization, each employee is responsible for minimizing dose to other workers and members of the public. Cimarron Corporation has an ALARA Suggestion Program for workers to provide comments and suggestions for dose minimization and improving the safety and efficiency of operations. Cimarron Corporation encourages employee participation in the ALARA Suggestion Program.

4.3 ALARA Committee

Cimarron shall have an ALARA Committee whose purpose is to ensure that ALARA policy, philosophy, commitments and regulatory requirements are integrated into all appropriate work activities.

The responsibilities of the ALARA Committee are:

- Ensuring that ALARA policy, philosophy, commitments, and regulatory requirements are integrated into all appropriate work activities.
- Reviewing and approving ALARA Program goals for Cimarron Corporation.
- Reviewing the effectiveness of the ALARA Program.
- Reviewing plans for activities to ensure that ALARA considerations are met.
- Annual review of Radiation Protection Program Policy to ensure compliance and to incorporate any necessary changes.
- Evaluate and approve changes to the Decommissioning Plan or Radiation Protection Plan in accordance with License Condition 27(e).

The ALARA committee shall be chaired by the RSO. The Vice-Chair shall be the Cimarron Site Manager. Other individuals with appropriate authority and technical expertise shall serve on the committee as deemed necessary by the Chair or Vice-Chair.

5.0 ASSESSMENTS

5.1 Section Overview

Audits and surveillances (assessments) of the Cimarron Radiation Protection Program provide a systematic approach to the review of key activities and the overall quality of Radiation Protection activities. These assessments help to assure that current program activities comply with license and regulatory requirements, program activities are performed in accordance with established policies, procedures and recognized good practices, unsatisfactory performance is identified and corrected, and any programmatic weaknesses are targeted and corrected. The assessment process includes continuous performance monitoring throughout the year.

5.2 Corporate Audits

Periodic Corporate Audits shall be used to evaluate the effectiveness of selected aspects of the Radiation Protection Program and to determine the adequacy of and adherence to established procedures, instructions, specifications, regulations and standards, and other applicable permitting and licensing requirements. Audits shall be conducted by the Kerr-McGee Corporate Auditor or designee.

5.3 Surveillances

Surveillances are job specific observations performed by the Health Physics or Quality Assurance Department to evaluate the implementation of the radiation protection program with respect to accepted practices (e.g., procedures, management directives, etc.), industry standards, and regulatory requirements.

5.4 Radiological Occurrence Reports

A Radiological Occurrence Report (ROR) is generated to document the facts, record the apparent and/or root cause, track the resolution and aid in trending radiological events. RORs are issued in accordance with the Cimarron Quality Assurance Plan.

6.0 PERSONNEL MONITORING

6.1 Section Overview

NRC regulations establish a total effective dose equivalent (TEDE) limit and a total organ dose equivalent (TODE) limit for occupationally exposed adults. The TEDE is the sum of the deep dose equivalent (DDE) from external exposures and the committed effective dose equivalent (CEDE) from internal exposures. The TODE is the sum of the DDE and the committed dose equivalent (CDE) to any individual organ and tissue. The policies outlined in this section also address requirements for protection of individual members of the public, whether living in the vicinity of Cimarron facilities or visiting. Policies are also presented for embryo/fetus monitoring and dose assessments.

6.2 Occupational Dose Limits

The following annual dose limits apply to all Cimarron employees, contractors, and visitors who receive occupational dose at Cimarron facilities. Occupational dose is defined as the radiation dose an individual receives in a restricted area and other work-related radiation dose the person receives, but does not include medical dose, dose due to background radiation, or dose received while a member of the public.

6.2.1 Occupational Dose Limits for Adults are as follows:

Whole Body - The more limiting of a total effective dose equivalent (TEDE) equal to 5 rem or the sum of the deep dose equivalent and committed dose equivalent to any individual organ or tissue, other than the lens of the eye, equal to 50 rem.

Skin - A shallow dose equivalent equal to 50 rem.

Lens of the Eye - An eye dose equivalent equal to 15 rem.

Extremities - A shallow dose equivalent equal to 50 rem.

6.2.2 Occupational Dose Limits to Minors are as follows:

The dose limits for minors shall be 10 percent of the corresponding limit for adults.

6.2.3 Occupational Dose Limits to Embryo/Fetus are as follows:

The dose to the embryo/fetus of declared pregnant women shall be limited to 500 mrem during the entire time of pregnancy. Substantial variations in dose rate shall be avoided.

6.3 Administrative Dose Limits for Occupationally Exposed Individuals

Administrative limits are used to control doses to insure that regulatory limits are not exceeded and that occupational exposures are maintained as low as is reasonably achievable (ALARA). The administrative limits also serve to alert health physics personnel to practices or trends in the work environment that are resulting in additional or excessive exposure to individuals. The company goal is that no individual shall exceed the administrative limits in any calendar year.

6.3.1 Administrative Dose Limits for Occupationally Exposed Adults are as follows:

Whole Body – The more limiting of a total effective dose equivalent (TEDE) equal to 4 rem or the sum of the deep dose equivalent and committed dose equivalent to any individual organ or tissue, other than the lens of the eye, equal to 40 rem. TEDE of 500 mrem per year if dose for the current year has not been determined and documented via NRC Form 5 (no dose extension permitted).

Skin – A shallow dose equivalent to 40 rem.

Lens of the Eye – An eye dose equivalent equal to 12 rem.

Extremities – A shallow dose equivalent equal to 40 rem.

Administrative dose limit extensions for occupationally exposed adults will be considered based upon the necessity of the operation. Approvals for dose extension shall only be made by the RSO after first reviewing the individuals exposure records and assessing the expected exposure to be received by the individual for the remainder of the year. Concurrence from the Site Manager is required prior to the approval of any dose extension.

6.3.2 Administrative Dose Limits for Minors are as follows:

Doses shall be administratively controlled by the ALARA Committee.

6.4 Dose Limits for Individual Members of the Public

The TEDE received by individual members of the public from licensed operations shall not exceed 100 mrem above background in a year in restricted areas. In addition, the dose in any unrestricted area from external sources shall not exceed 2 mrem above background in any one hour.

6.5 Determination of Prior Occupational Exposure

The occupational dose during the current year shall be determined and an attempt shall be made to obtain records of lifetime dose for all personnel who are likely to receive a dose in excess of 10% of the annual dose limit. The prior dose history shall be documented on Form NRC-4, or equivalent. Forms NRC-4 and NRC-5 and records used in their preparation shall be retained by Cimarron until the Department terminates each pertinent license requiring this record and in accordance with the Cimarron Quality Assurance Plan.

6.6 Personnel Monitoring for External Radiation

Cimarron shall issue individual monitoring devices to any individual who is likely to receive a dose in excess of 10 percent of the occupational limits. Monitoring shall also be performed to measure the dose to the embryo/fetus when declaration of pregnancy is made.

Dosimetry devices shall be processed by a laboratory or vendor maintaining accreditation by the National Voluntary Laboratory Accreditation Program (NVLAP). In addition, dosimetry devices shall be capable of measuring the deep dose equivalent (DDE) at a tissue depth of one centimeter, measuring the eye dose equivalent (LDE) at a tissue depth of 0.3 centimeter, and capable of measuring the skin dose equivalent (SDE) at a tissue depth of 0.007 centimeter.

6.7 Visitors

Visitors are not subject to individual monitoring, record keeping, and reporting requirements of 10 CFR 20. However, they (or one person in their group) may be issued a dosimeter for verification purposes. A permanent record may be maintained of the individual's dosimeter readings to document that monitoring was not required. Written reports of any measured dose shall be issued to the individual upon request. All Visitors shall be escorted by a qualified escort or under the direct observation of a qualified escort at all times while in the Restricted Area.

6.8 Skin Monitoring

Due to the difficulty of assessing skin exposure, skin dose rates should be minimized as much as practicable by shielding or decontamination. The non-

penetrating radiation energies and dose rates should be determined and sufficient protective clothing should be used to prevent substantial skin doses. The shallow dose equivalent to the skin from external radiation sources should be monitored by a dosimeter.

6.9 Internal Exposure Monitoring

Baseline in-vivo and/or in-vitro monitoring shall be performed for all individuals prior to performing radiation work involving respiratory protection equipment or work that could involve an intake of radioactive materials. Additional bioassay sampling shall be performed at the direction of the RSO.

Intakes shall normally be calculated based upon the results of the air monitoring program, unless the time of intake is well defined, the lung Class is known, or bioassay results are significantly higher than detection limits.

In-vivo and/or in-vitro bioassay sampling shall be performed whenever a calculated intake of 40 DAC-hours may have occurred in any one incident based on air sampling data, accident conditions, equipment failure, external contamination, or other conditions. In-vitro and/or in-vivo bioassay sampling should also be performed whenever it is likely that an individual may have received an intake of 10 milligrams uranium in any one week. In-vivo and/or in-vitro bioassay should also be considered upon termination of all radiation workers who may have had intakes of radioactive materials. In-vivo and/or in-vitro bioassay sampling shall be considered for all Declared Pregnant Women (DPW) at the time of declaration. The need for bioassay sampling shall be determined by the RSO.

6.10 Declared Pregnant Woman (DPW) Exposure Policy

Based on recommendations of the National Council on Radiation Protection and Measurements (NCRP) and on regulatory requirements, controls are established for the protection of the embryo/fetus during a declared female workers pregnancy. These controls shall ensure compliance with regulatory requirements and protect the rights of the female worker.

Declaration of pregnancy is at the discretion of the woman (medical proof is not required). Any woman who does not declare her pregnancy shall be subject to the normal occupational dose limits and shall not be subject to special controls or treatment with respect to work assignments involving exposure to radiation even if she is pregnant. Cimarron shall ensure the dose to the embryo/fetus of a declared pregnant woman does not exceed regulatory limits due to occupational dose during the pregnancy.

6.11 Exposures Exceeding Annual Dose Limits

In cases where Cimarron administrative dose limits are exceeded without prior authorization, the RSO shall investigate to determine the cause and prepare a written report. A Radiological Occurrence Report shall be initiated and a copy of the investigation report shall be sent to the individual's exposure records file. The objective of the initial investigation shall be to establish the sequence of events resulting in the exposure and the level of dose received. The individual shall not be allowed to enter a Restricted Area until the investigation has been conducted.

6.12 Personnel Exposure Reports

An annual summary report of the individual radiation dose received at Cimarron facilities shall be sent to each worker who was issued primary dosimetry. When requested by an individual, a written exposure report shall be provided to each such individual within 30 days of the request or within 30 days of exposure determination, whichever is later.

Internal and external doses shall be summed whenever positive doses are measured. The dose to the lens of the eye, skin, and extremities are not included in the summation. Intakes through wounds or skin absorption shall be evaluated and, to the extent practical, accounted for in summation of internal and external doses independent of intakes by ingestion or inhalation.

Records of individual monitoring shall be kept in accordance with 10 CFR 20.1203 and the Cimarron Quality Assurance Plan. These records shall be updated at least annually. All radiation exposure records shall use the units curie, rem, rad, or multiples thereof and shall clearly and specifically indicate the quantities (e.g., deep dose equivalent) and units (e.g., rem or mrem) of all recorded values.

Records of embryo/fetus dose shall be maintained with those of the mother, including the declaration of pregnancy.

7.0 RADIATION PROTECTION INSTRUMENTATION

7.1 Section Overview

Many different types of radiological measurement instrumentation are utilized at Cimarron for radiation protection purposes. This section addresses the requirements for calibration, maintenance, and of the instruments. The criteria in this section is intended to ensure compliance with NRC regulations and Cimarron policies and shall conform, to the extent practicable, with applicable industry standards.

7.2 Instrument Inventory

A sufficient inventory and variety of operable and calibrated portable, semi-portable and fixed radiological instrumentation shall be established and maintained to adequately assess and monitor the radiological hazards.

7.3 Calibration

Calibration of radiation monitoring, counting, and air sampling instruments, should be performed in accordance with ANSI N323-1978, "Radiation Protection Instrumentation Test and Calibration."

The calibration frequency for portable radiation monitoring instruments and portable air sampling equipment shall be at least every 6 months. Semi-portable (e.g., continuous air monitors, personnel contamination monitors) and fixed (e.g., countroom/laboratory instrumentation, portal monitors) instrumentation shall be calibrated at least annually.

7.4 Operation and Response Tests

Operation of radiation monitoring, counting, and air sampling instruments, shall only be performed by personnel qualified in the use of the instrument. Additionally, operation shall be performed in accordance with the operational procedure for each type of instrument in use. Operation shall be performed in accordance with regulatory requirements and should conform to industry standards and guidance.

Operation procedures shall include response test requirements and should be consistent with ANSI N323-1978, "Radiation Protection Instrumentation Test and Calibration."

7.5 Maintenance and Repair

Maintenance and repair of radiation protection instrumentation shall be performed by qualified personnel or an approved vendor. All maintenance and repair shall be documented.

7.6 Quality Control/Quality Assurance

A Quality Control (QC) Program for counting instruments shall be established and maintained to ensure reliability of counting results and sensitivities. QC for counting instruments should be proceduralized or based on manufacturer's instructions and be consistent with ANSI N323-1978, "Radiation Protection Instrumentation Test and Calibration" and regulatory requirements.

Review and evaluation of instrumentation operability shall be performed on an on-going basis by the RSO or designee.

The Quality Assurance (QA) Program for laboratory instrumentation should be consistent, to the extent practicable, with the requirements of USNRC Regulatory Guide 4.15, "Quality Assurance for Radiological Monitoring Programs (Normal Operations) - Effluent Streams and the Environment."

8.0 ACCESS CONTROL

8.1 Section Overview

The Access Control program provides the access control requirements established for all entry into and exit from the Cimarron Facility. The Access Control Program is designed to ensure that all individuals have received appropriate qualifications, training, and authorization for entry. The access control requirements are applicable to all Cimarron personnel, contractors and visitors who frequent the Controlled Area, Restricted Area/Radiologically Controlled Area (RCA).

8.2 General Requirements

- All Cimarron personnel who normally work within restricted areas shall be issued dosimetry.
- Only properly trained or escorted personnel shall be permitted inside the Restricted Area.
- Visitors shall surrender personal dosimetry to security when leaving the facility.
- Cimarron employees and contractors shall store badges in proper storage locations prior to leaving the facility.
- Unescorted individuals working in the RCA shall be required to receive radiation worker training.

8.3 Controlled Area Access Controls

Controlled areas at the Cimarron Facility include all areas outside of the restricted area fence, but within the site boundary for which access can be limited for any reason. The Cimarron Facility currently maintains 24 hour guard watch over the facility entrance.

8.4 Restricted Area/Radiologically Controlled Area Access Controls

RCAs are those areas within the fenced area of the Cimarron Facility that require the completion of specific training prior to entry. RCAs include Radioactive Materials Areas, Radiation Areas, and Airborne Radioactivity Areas. RCAs may be controlled through the use of guards, barriers, fences, signs, gates, or doors. Individuals granted unescorted access to the RCAs shall be provided with dosimetry which should be stored at the main access control point when not in use.

RCA boundaries shall be defined by the use of postings, barriers, walls, tape, ropes, markings, or locked doors. Each access point for RCA's at the Cimarron facility shall be posted.

8.5 Posting Requirements

Each radiation area, airborne radioactivity area, and radioactive materials area shall be posted in accordance with 10 CFR 20.1902 unless excepted from posting under the provisions of 10 CFR 20.1903.

9.0 SPECIAL WORK PERMITS

9.1 Section Overview

A Special Work Permit (SWP) is a document or series of documents prepared by the Project Manager, with input and approval from appropriate departments (i.e., Health Physics, Quality Assurance), as necessary, to inform individuals of the radiological and non-radiological conditions that exist in the work area and the safety requirements for the job. The ALARA review process is an integral part of the SWP process and is performed prior to completing a SWP.

SWP's are required when hazardous or radioactive materials are present in quantities that could result in health hazards due to the work to be performed. Cimarron does not intend for a SWP to be automatically required whenever work is performed in a restricted area. However, radiation work shall require a SWP when it is performed in posted Radiation Areas, and Airborne Radioactivity Areas. Work performed in posted Radioactive Materials Areas may or may not require an SWP, depending on the type of work to be performed. For example, maintenance activities such as clean oil changes, light bulb changes, equipment maintenance, lawn mowing, site tours, management inspections, environmental monitoring and measurements, work with check sources, and security patrols shall not normally be performed under the controls of a SWP. These types of activities are routine activities and past experience has demonstrated that they are not a source of dose to participants. Activities such as contaminated earth-moving, placement of materials in the disposal cell, decontamination of buildings and equipment, and work that could generate contaminated airborne material shall be performed under the direction of a SWP.

9.2 SWP Preparation

SWP documentation shall consider all safety and radiological hazards and protective equipment needed for the project. SWPs should include information on the nature of the work, equipment needed to perform the job, work procedures, safety requirements, necessary surveys, training requirements, and records to be maintained. A man-hour estimate and dose estimate shall be performed for each SWP. Evaluations are performed based upon the above documentation, and the SWP requirements shall be written to incorporate all health and safety considerations.

9.3 SWP Requirements

The SWP job description shall be consistent with the activities or task to be performed. Personnel monitoring requirements, radiological survey requirements,

and health physics oversight requirements shall be written onto the SWP. In addition, any special sampling requirements, such as air sampling, shall be included as SWP requirements. The location identified on the SWP shall be consistent with the work being preformed. The SWP shall be posted on the SWP Bulletin Board and/or at the job site. The job Supervisors shall review the provisions of specific SWPs with their workers prior to work starting.

9.4 SWP Approval

The Radiation Safety Officer, or designee, shall approve all SWPs.

9.5 SWP Training

Each individual who performs work governed by a SWP shall receive training regarding the SWP. SWP training shall be documented by having the worker sign a form acknowledging that training was received.

10.0 RADIATION PROTECTION SURVEYS

10.1 Section Overview

This section provides a general description of the requirements for performance and documentation of radiation protection surveys. Radiological surveys are performed in order to identify, quantify and evaluate the potential hazard associated with the radiological conditions in the area. Survey information is used to assist in the development of Special Work Permits, to inform individuals of the radiological conditions/hazards in the area, to determine area postings (if required), to determine the type(s) of personnel protective equipment necessary, and to ensure personnel exposures to radiation and radioactive materials are maintained ALARA.

10.2 General Requirements

Cimarron shall conduct radiation and contamination surveys, perform air sampling, and take samples to assess radiation fields, to verify that radiological conditions have not changed, and to establish specific radiological controls for work to be performed. Decommissioning surveys shall be performed, to the extent practical, to conform with NUREG/CR-5849, the U.S. NRC Branch Technical Position for Onsite Storage and Disposal of Uranium and Thorium, and the 1987 U.S. NRC "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material."

Contact dose rates are used to locate and identify the maximum radiation levels to which personnel could be exposed as well as localized sources of radiation which present unique radiological concerns.

Indirect (smears) and direct (fixed) contamination surveys are performed to detect and quantify radioactive contaminants. Qualitative (large area) loose-surface contamination surveys should be periodically performed to ensure that radioactive contamination has not inadvertently spread.

Cimarron shall incorporate the guidance of U.S. NRC Regulatory Guide 8.25, "Air Sampling in the Workplace" as an acceptable method for meeting certain survey and dose assessment requirements of 10 CFR 20. An annual review of the previous year's air sampling activities should be done and may be combined with reviews of other aspects of the radiation protection program. Continuous air samples shall be collected whenever the airborne activity levels exceed or are expected to exceed 10 percent of the Derived Air Concentration (DAC). Expected airborne activity concentrations shall be determined prior to work through evaluation

of historical airborne concentrations from similar work performed in the past and from knowledge of the contamination levels.

Breathing zone (BZ) air sampling shall be performed as necessary to establish the concentrations of radioactive contaminants available for inhalation by the worker. In addition, BZ sampling shall be performed whenever respiratory protection devices are worn by personnel. BZ samples shall be analyzed every shift or after each operation, whichever is shorter. If air sample data indicates a measured level greater than 40 DAC-hours, the RSO shall conduct an investigation and take corrective actions to reduce airborne contamination levels.

Air sample collection media shall be appropriate to address the radionuclide mixture(s) present. In addition, the analysis of air samples (including preliminary field screening) shall be performed in a timely and expeditious manner.

Appropriate instrumentation for common survey and analyses shall be procedurally addressed.

10.3 Routine Surveys

Surveys shall be conducted at a frequency commensurate with the hazards present and the personnel occupancies in a given area. Survey frequencies should maintain personnel exposures ALARA.

10.4 Investigative Surveys

Investigative surveys shall be performed as soon as practicable following the discovery or indication of abnormal radiological conditions.

Appropriate air samples shall be collected in areas where unanticipated personnel contamination occurs and where equipment has failed and the failure may cause elevated airborne radioactivity. If air sample data indicates a measured level greater than 40 DAC-hours, the RSO shall conduct an investigation and take corrective actions to reduce airborne contamination levels.

10.5 Personnel Contamination Monitoring

Personnel shall routinely perform contamination monitoring (frisking) prior to exiting the Radiologically Controlled Area. A hand and foot frisk shall be performed at a minimum, when exiting the Radiologically Controlled Area. Cimarron has not established administrative limits for personnel radioactive contamination. Personnel surveys are performed by workers as they leave contaminated areas and also upon egress from the Restricted Area. These surveys are qualitative in nature.

Personnel are instructed to notify Health Physics when radioactivity levels exceeding background are found on the skin, clothing, or personal items. Health Physics personnel will then determine the need for decontamination. In accordance with the ALARA concept, radioactive materials on skin, clothing, or personal items will be minimized to the extent practicable before allowing an individual to leave the facility. Decontamination of individuals shall be performed in accordance with specific procedures. Any individual who cannot be decontaminated to background levels is instructed by the RSO or designee regarding the risks involved and follow-up actions that may be necessary. RSO and/or Site Manager approval is required prior to departure of any contaminated individual from the controlled area, except when emergency conditions dictate other actions.

10.6 Survey Training and Documentation

Surveys are performed by radiation workers who have been trained commensurate with the type of surveys to be performed. Training will address the appropriate instrumentation to be used, operational and response checks for survey instrumentation, survey methods, recording of data, calculations, data evaluation, and action levels, as applicable. Radiation and contamination surveys performed for compliance purposes, or to demonstrate that decommissioning criteria have been met, shall be documented and maintained in accordance with 10 CFR 20, Subpart L.

11.0 RADIOACTIVE MATERIALS CONTROL

11.1 Section Overview

Radioactive material (RAM) controls are established to provide positive control of radioactive material, prevent inadvertent release of radioactive material to unrestricted areas, ensure protection of members of the public and workers, and to minimize the amount of radioactive waste generated during operations. This section of the Plan addresses receipt, labeling, movement, control, transfer, shipment, and movement of RAM, as well as sealed source controls.

11.2 Receipt, Labeling, and Storage of RAM

All radioactive materials received shall be in accordance with radioactive material license possession limits. The individual responsible for radioactive material receipt shall perform all surveys and paperwork review for the shipment to ensure compliance with 49 CFR. Each container of radioactive material shall be labeled as required by 10 CFR 20.

Radioactive material shall be secured against unauthorized access or removal. Radioactive material storage areas shall be posted and controlled using appropriate barriers and radiological postings.

11.3 Shipment and Transfer of Radioactive Material

RAM shipments shall comply with NRC and U.S. Department of Transportation Regulations. Low-level radioactive waste shipments transferred for disposal shall be accompanied by a shipment manifest prepared in accordance with 10 CFR 20. Radioactive material shall only be transferred to authorized individuals in accordance with the appropriate regulations in 10 CFR 20, and 10 CFR 70.

11.4 Controls for Radioactive Sources

The Radiation Safety Officer shall approve all requisitions for sealed radioactive sources and ensure that source inventories are performed on a quarterly basis. Sealed sources (except exempt quantities) shall be tested for leakage and/or contamination upon receipt and on a quarterly basis.The RSO shall approve locations for storage of sealed radioactive sources. Source storage areas shall be locked and posted per 10 CFR 20.

11.5 Theft or Loss of Radioactive Material

Any individual who discovers that radioactive material is lost, stolen, or missing shall immediately notify the RSO. The RSO shall evaluate the physical and radiological characteristics of the missing material and the potential hazards to workers and the general public, initiate an investigation to locate the material, and perform a root cause evaluation of the incident. The RSO shall determine the need for notifications to regulatory authorities and make notifications if necessary.

12.0 CONTAMINATION CONTROL

12.1 Section Overview

The purpose of contamination control is to prevent and/or minimize the spread of contamination to individuals, areas, and equipment. Control of radioactive surface contamination minimizes possible inhalation or ingestion of radioactivity by personnel, skin dose from small particles of radioactivity, and the spread to or build-up of radioactivity in the facility or environment from decommissioning operations.

12.2 General

Cimarron shall maintain restricted areas of the facility, equipment, below the smearable contamination limit of 5,000 dpm/100cm^2 gross alpha. In addition, Cimarron shall establish Contaminated Area control, including posting, whenever smearable contamination in an area exceeds 1,000 dpm/100cm^2. Cimarron shall incorporate the ALARA philosophy when selecting decontamination methods and practices.

As a general rule, decontamination should be performed by working from areas of low contamination to areas of high contamination. Decontamination materials should be limited to the minimum required for the task. All decontamination materials shall be collected, monitored, and properly dispositioned.

12.3 Control and Use of Radiological Containments

The Health Physics Department, along with Job Supervisors, shall determine the need for a particular type of containment to control the spread of contamination.

12.4 Contaminated Personnel

The performance of non-routine monitoring (e.g., contaminated personnel) shall be proceduralized. Decontamination of personnel shall be performed under the guidance of health physics personnel and shall incorporate good health physics practices and ALARA. Cimarron shall not allow an individual whose skin or personal clothing is found contaminated above background to exit a controlled area without prior approval of the Site Manager or RSO. Appropriate surveys and monitoring shall be performed to evaluate dose to the individual resulting from contamination.

12.5 Spill of Radioactive Material

A spill of radioactive material requires immediate actions which include stopping the spill, warning other personnel, isolating the area, and minimizing radiation exposure. Supplementary actions should include the performance of radiological surveys in immediate and adjacent areas, including downwind.

13.0 UNCONDITIONAL RELEASE OF MATERIALS

13.1 Section Overview

Cimarron is authorized to unconditionally release tools, equipment, parts, and materials provided that radiation levels and surface contamination levels do not exceed the limits contained in the Cimarron license. Material to be unconditionally released from RCA's shall be surveyed to ensure compliance with the unconditional release criteria.

13.2 Survey Instrumentation Requirements

The energy dependence of the monitoring instruments to alpha, beta, and gamma radiation shall be known and documented in accordance with the Instrumentation Program. In addition, all instruments used to survey material for unconditional release shall be calibrated with NIST traceable, or equivalent standard sources for similar energies and geometries to the materials being released.

13.3 Radiological Analysis/Characterization

Radiological analysis shall be performed to identify radionuclides present when necessary. In general, all remaining materials at the Cimarron Facility have been demonstrated to have enriched uranium as the primary and limiting contaminant.

13.4 Unconditional Release Criteria

Contamination levels for material to be unconditionally released for unrestricted use shall be less than the most restrictive values listed in the NRC "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," August, 1987, or Cimarron's radioactive materials licenses.

13.5 Unconditional Release of Materials

Personnel shall monitor for contamination on their person and on hand carried items (e.g., tools and equipment). Materials to be released for unrestricted use from the RCA shall be surveyed by qualified individuals. These surveys shall be performed in such a manner and with appropriately sensitive instrumentation to ensure the tools, equipment or material meets the unconditional release limits.

13.6 Unconditional Release Surveys

Unconditional release surveys shall consist of direct (fixed) and removable (smearable) monitoring methods to assess the residual surface contamination of the material being monitored. If an item of material or equipment is determined to meet the unconditional release criteria, it shall be segregated in a well defined area or container. Items not meeting the unconditional release criteria shall not be released until further decontamination has been performed and surveys indicated that the material meets the unconditional release criteria in Section 13.4.

14.0 RESPIRATORY PROTECTION

14.1 Section Overview

Respiratory protection measures shall be employed when necessary to protect workers from a variety of airborne hazards. The hazards may be of a radiological or non-radiological nature. The respiratory protection program shall meet the requirements found in 10 CFR 20, Subpart H, "Respiratory Protection and Controls to Restrict Internal Exposure in Restricted Areas" for radiological hazards and the Code of Federal Regulations Title 29 Part 1910.134 for non-radiological hazards.

The Respiratory Protection Program shall include the following elements as required by NUREG-0041, "Manual of Respiratory Protection Against Airborne Radioactive Material":

- Written standard operating procedures and policy statement;
- Proper selection of equipment, based on the hazard;
- Proper training and instruction of users;
- Proper fitting, use, cleaning, storage, inspection, quality assurance, and maintenance of equipment;
- Appropriate surveillance of work conditions, degree of employee exposure to stress;
- Regular inspection and evaluation to determine the continued program effectiveness;
- Program responsibility vested in one qualified individual;
- An adequate medical surveillance program for respirator users;
- Use of only Bureau of Mines/National Institute of Occupational Safety and Health (NIOSH) certified equipment; and
- Maintenance of a bioassay program.

Respiratory Protection Program requirements shall only apply when respiratory protection devices are called for due to the work to be performed and shall be implemented prior to and during use of respiratory protection equipment.

14.2 Respiratory Protection Policy Statement

It is Cimarron Corporation policy to maintain personnel exposure to both internal and external hazards as low as is reasonably achievable (ALARA). Personnel exposure to airborne contaminants shall be limited by process and engineered controls whenever possible. However, under some conditions, process and engineered controls may not be feasible or provide adequate assurance that exposure to contaminants will be maintained ALARA. In such instances, respiratory protection devices may be required for individuals performing work in areas

containing airborne contaminants if the use of the equipment maintains overall exposure ALARA. Consideration of both internal and external hazards shall be made when evaluating the need for respiratory protective equipment.

When respirators must be used, appropriate rest or relief periods shall be provided. An individual wearing a respirator may leave the work area at any time for relief in the event of equipment malfunction, physical or psychological distress, procedural or communication failure, significant deterioration of work area conditions, or any other condition that might require relief.

Cimarron Corporation is committed to establishing and maintaining a respiratory protection program consistent with the goal of protecting its employees. It is therefore the policy of this company that all employees, when using respirators in the workplace, or administering the Respiratory Protection Program, shall adhere to the principles established in the written procedures.

14.3 Engineering and Administrative Controls

Cimarron health physics and supervisory personnel evaluate all radiation work which could result in exposures to airborne radioactivity in accordance with Section 9.0, "Special Work Permits". This evaluation includes means to ensure that dose to workers is maintained ALARA. Engineering practices may include the use of vacuum systems discharging through HEPA filtration devices, dust suppression and control by wetting of surfaces and soils, washing down equipment and materials prior to handling, vacuuming of surfaces, and the use of tents, glove boxes, and hoods. Workers are trained to stand up-wind of work, perform surveys of work areas for airborne contaminants and loose surface contamination, and to perform work in open areas rather than in confined areas when practical. Other techniques will be used and implemented as necessary.

Respirators shall be used to control personnel exposure to airborne radioactive materials when administrative and engineered controls are not practical or fully effective and the use of respirators result in Total Effective Dose Equivalent (TEDE) being ALARA. Administrative controls shall be used to limit personnel access to or time spent in an area requiring respiratory protective equipment. Engineered controls shall be used, to the extent practicable, to limit of airborne contaminants and to control airborne radioactive materials.

14.4 Determination of Respiratory Protection Requirements

An air sampling program sufficient to determine the potential hazards, permit proper equipment selection, and estimate exposures shall be established. Determination of respiratory protection requirements and selection of equipment for non-radiological contaminants shall be made by the RSO or designee.

14.5 Selection of Respiratory Devices

Respiratory protection device selection shall consider all hazards and working conditions and shall incorporate ALARA philosophy. Respiratory protective equipment shall provide a protection factor (in accordance with Appendix A to 10 CFR 20) which is greater than the multiple by which peak concentrations of radioactive material in the working area are expected to exceed the Derived Air Concentration given in Table 1, Column 3 of Appendix B to 10 CFR 20. If the selection of a respiratory protection device with a protection factor greater than the peak concentration is inconsistent with the goal of keeping the total effective dose equivalent (TEDE) ALARA, equipment with a lower protection factor may be selected when the equipment will result in keeping the TEDE ALARA.

In the event of an emergency requiring the us of respiratory protective equipment, Cimarron shall use equipment that has been specifically certified or had certification extended for emergency use by NIOSH/MSHA.

14.6 Facial Hair Policy

Individuals using tight-fitting respirators shall not have any facial hair that interferes with the sealing surface of the respirator.

14.7 Medical Requirements

A medical examination (physical) shall be performed by a physician on all personnel who will use respiratory protection equipment in the course of work. The physical shall be performed prior to the wearing of any respiratory protection device. Physical examinations shall be required at least annually (every 12 months) for personnel who wear respirators. Respirator users shall be medically evaluated to ensure they posses the physical and psychological capabilities necessary to perform tasks while wearing a respirator. This medical evaluation shall use Regulatory Guide 8.15, "Acceptable Programs for Respiratory Protection" as guidance in determining if an individual is medically qualified to wear respiratory protection equipment.

14.8 Training

Training in the proper use and maintenance of respiratory protective equipment shall be provided annually to all users of the equipment. Personnel shall be instructed that cartridges and filters are to be charged when necessary due to dust loading which results in difficulty in breathing or increased levels of contamination on the cartridge. Personnel shall also be trained regarding Cimarron Corporation policies that address relief from respiratory or other stress caused by the wearing of respiratory protective equipment.

14.9 Respirator Fit Testing

Respirators with a tight-fitting face piece shall be fit tested to each individual to verify that an adequate seal can be obtained. The fit-testing shall be performed prior to first use for all users and shall be repeated at a frequency not to exceed 12 months. Fit-testing shall be performed only on individuals who have a current medical approval, received respiratory protection training within the past year and are clean shaven. Respirators shall be tested for operability by the user (e.g., negative pressure test for full face respirators) immediately prior to each use.

14.10 Respirator Maintenance

Respirators shall be cleaned and disinfected after each use. Respirators shall be inspected after each cleaning and necessary maintenance shall be performed. Respirators shall be stored in clean sanitary conditions. Respirators ready for issue shall be free of significant smearable and fixed surface contamination.

14.11 Corrective Lenses

Personnel requiring corrective lenses when wearing a full-face respirator shall wear prescription eye glasses approved for use inside a full-face respirator or contact lenses.

14.12 Supplied Breathing Air

All sources of breathing air shall meet the requirements for Grade D breathing air as specified in ANSI/CGAG-7.1 - 1989, "Commodity Specification for Air." Fittings to supplied air systems manifolds and cylinders shall be unique such that the introduction of gases other than pure breathing air is prohibited. Sources of breathing air shall be approved by the RSO.

14.13 Bioassay

Personnel bioassay results shall be used to verify the respiratory protection program's effectiveness for selection of adequate respiratory protection devices and provision of properly functioning respiratory protection devices.

15.0 ENVIRONMENTAL MONITORING

15.1 Section Overview

Environmental monitoring shall be performed at the controlled area boundary and at various locations outside of the restricted areas to ensure that the conditions of Cimarron's radioactive materials license and all applicable regulations are complied with. Cimarron shall monitor all potential environmental pathways through appropriate measurements. This program will be modified as decommissioning activities reduce the potential for exposure to the general public. The following sections describe the environmental monitoring program that is currently in place.

15.2 Surface Water Monitoring

Surface water samples are collected annually and are analyzed for Fluoride, NO_3 (as N), gross alpha, and gross beta. Additional analysis for isotopic uranium is performed if the gross alpha action level of 15 pCi/L or gross bets action level of 20 pCi/l is exceeded. Analysis for Tc-99 shall be performed if the gross beta to gross alpha ratio exceeds 3:1 and gross beta exceeds 30 pCi/L. Sampling locations and analyses are summarized in Table 15-1. Figure 15-1 shows the sampling locations. The RSO notification action level (see Section 15.8) for surface water is 50 percent of the effluent concentration limit found in Appendix B to 10 CFR 20.

15.3 Ground Water Well Monitoring

Ground water well samples are collected annually and are analyzed for the same constituents as given above for surface water. Additional analysis for isotopic uranium is performed if the gross alpha action level of 15 pCi/L or gross beta action level of 20 pCi/l is exceeded. Analysis for Tc-99 shall be performed if the gross beta to gross alpha ratio exceeds 3:1 and gross beta exceeds 30 pCi/L. Sampling locations and analyses are summarized in Table 15-1. Figure 15-2 shows the ground water sampling locations. The RSO notification action level for ground water is 50 percent of the effluent concentration limit found in Appendix B to 10 CFR 20.

15.4 Samples Exceeding Action Levels

Immediate notification shall be made to the RSO of any samples or doses exceeding action levels. In the event that sample analytical results exceed action levels, the RSO shall perform an investigation consisting of one or more of the following actions, as appropriate.

- Verification of laboratory data and calculations;
- Analyze and review probable causes;

- Evaluate the need for sample re-analysis or additional analysis;
- Evaluate the need for re-sampling;
- Evaluate the need for sampling of other environmental pathways;
- Evaluate the need for notifications to regulatory agencies;
- Evaluate the need to perform dose assessment.

Notifications and reports shall be made to the NRC in accordance with 10 CFR §20.2202 and §20.2203 when necessary based upon the above evaluation.

15.5 Laboratory and Environmental Monitoring Program Quality Control Requirements

Laboratory counting performed for purposes of environmental or effluent stream monitoring should comply with the requirements of U.S. NRC Regulatory Guide 4.15. Laboratory minimum detectable limits shall be less than or equal to 50 percent of the action levels for all environmental media.

15.6 Records

Records of environmental monitoring data shall be kept indefinitely after license termination until they are determined to be of no further use by management. The minimum time period for record retention shall be ten years after termination of the licenses.

15.7 Quality Control in Sampling

Steps should be taken to ensure that samples collected are representative of the material sampled. Sample integrity should be maintained from the time of collection to time of analysis. Cimarron shall utilize sample chain of custody documentation to track environmental samples sent to off-site laboratories for analysis.

Quality control records for laboratory counting systems shall include the results of measurements of radioactive check sources, calibration sources, backgrounds, and blanks.

15.8 Reference Standards

All standards used for calibration of laboratory equipment shall be NIST traceable when such standards are available.

15.9 Performance Checks of Radiation Measurement Systems

Scheduled checks should be performed on laboratory equipment to determine background counting rate and response to check sources. Corrective actions shall be taken whenever measurement values fall outside of predetermined control values. Background counting should normally be performed daily or before each use. Check source measurements are usually measured daily or with each batch of samples counted on automated equipment.

15.10 Calculations and Computations

Calculations and computations used in determining concentrations of radioactive materials shall be independently checked prior to implementation. The calculations shall be proceduralized and implemented in accordance with quality assurance requirements for procedure development.

15.11 Audits

Periodic audits shall be made of the laboratory and environmental monitoring program to verify implementation of the quality assurance program. Audit results shall be documented and follow-up actions taken when required.

TABLE 15-1
CIMARRON FACILITY ENVIRONMENTAL SAMPLING SCHEDULE

Location	Description	Frequency	Analysis	Action Level
	SURFACE WATER			
1201	Cimarron River - Upstream	(Annually)	F	None
1202	Cimarron River - Downstream		NO_3	None
1204	Pond - West of Plant		Gross Alpha	15 pCi/l
1205	Kerr-McGee Lake - East		Gross Beta	20 pCi/l
1206	Slough - NW of Incinerator			
1208	Stream North of Uranium Pond #2			
1209	Kerr-McGee Lake - West			
	GROUNDWATER WELLS			
1311	Monitor Well - South of Landfill	(Annually)	F	None
1312	Monitor Well - West of Landfill		NO_3	None
1313	Monitor Well - North of Landfill		Gross Alpha	15 pCi/l
1314	Monitor Well - South of Burial Pit		Gross Beta	20 pCi/l
1315R	Monitor Well - North of Burial Pit			
1316R	Monitor Well – Northwest of Burial Pit			
TMW-13	Monitor Well North of Burial Pit			
1319	Monitor Well - U Plant Yard East of Building			
1320	Monitor Well - North of Designated Area			
1321	Monitor Well - North of Designated Area (deep)			
1322	Monitor Well - By Flammable Liquid Storage Pad			
1323	Monitor Well - By Flammable Liquid Storage Pad (deep)			
1324	Monitor Well - East of Designated Area			
1325	Monitor Well - South of Designated Area			
1326	Monitor Well - East of U-Plant Yard			
1327B	Monitor Well - West of U-Plant Yard			
1328	Monitor Well - South of U-Plant Yard (deep)			
1329	Monitor Well - South of U-Plant Yard			
1330	Monitor Well - Southwest of U-Plant Yard			
1331	Monitor Well - Northeast of Pu-Plant Yard			
1332	Monitor Well - West of Sanitary Lagoons (deep)			
1333	Monitor Well - West of Sanitary Lagoons			
1334	Monitor Well - North of Sanitary Lagoons			
1335A	Monitor Well - West of Designated Area			
1336A	Monitor Well - North of U Pond #2			

* See applicable section of Radiation Protection Plan for specific requirements when action level is exceeded.

FIGURE 15-1
Surface Water Sampling Locations

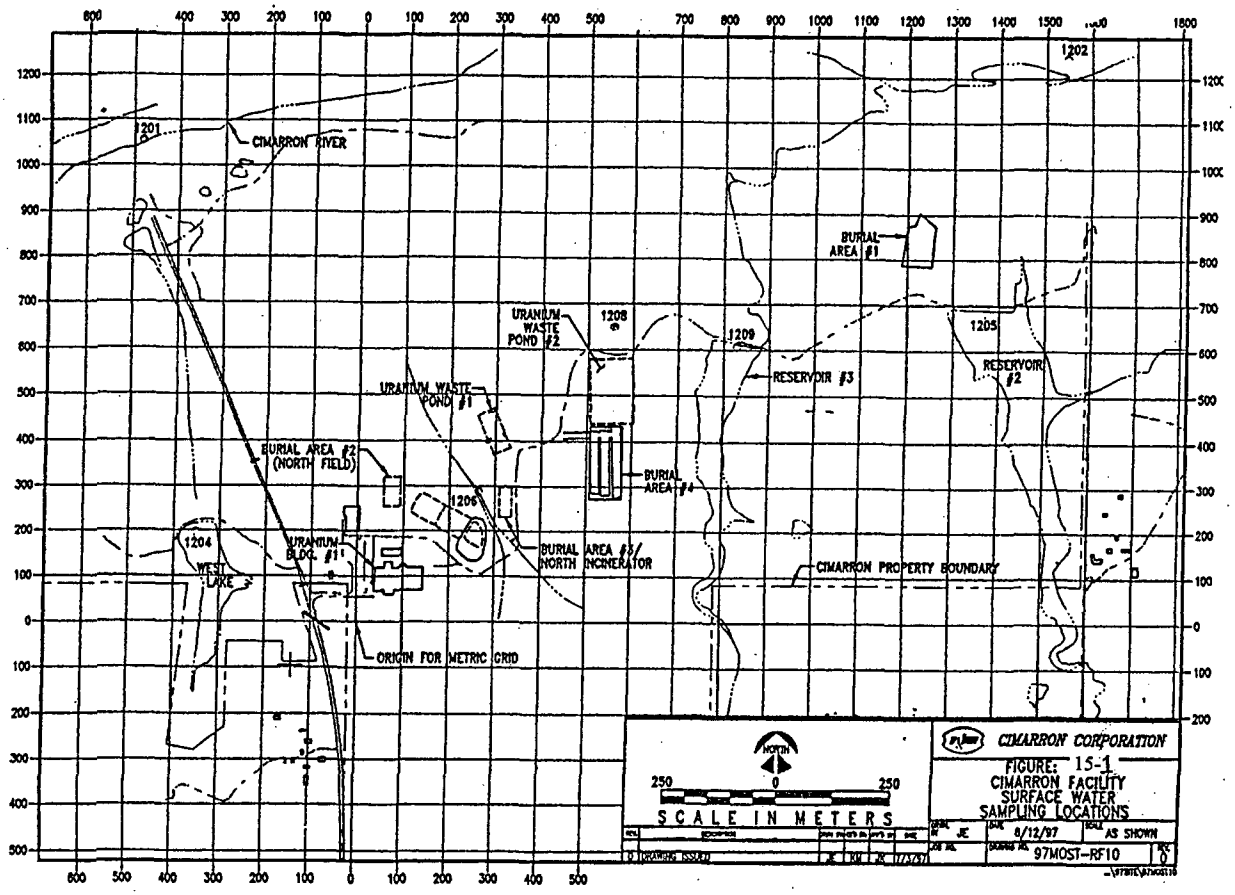


FIGURE 15-2
Groundwater Well Locations