SUPPLEMENTAL INFORMATION
NEEDED FOR REVIEW
OF CIMARRON FACILITY DECOMMISSIONING PLAN REV- 1

SECTION 2.7.6: GROUNDWATER MODELS

The licensee provided a description of the numerical analyses techniques used to characterize the unsaturated and saturated zones. The licensee stated that a previously developed groundwater numerical model has been revised and updated for the Cimarron site. The updated groundwater numerical model was used to support groundwater remedial design in terms of layouts of extraction wells and pumping rate. Consequently, the input parameters to the numerical model may have been revised. An updated discussion of the groundwater flow model needs to be provided in the decommissioning plan (DP), including the numerical groundwater input files so that NRC staff can independently verify the modeling results.

SECTION 3.5: GROUNDWATER

The licensee referenced reports describing the groundwater assessment, but a summary of the impacted aquifers in separate areas of the site is not explicitly included. Please provide a brief description of the aquifers that need to be remediated.

SECTION 3.5.3: CURRENT EXTENT OF CONTAMINANTS OF CONCERN IN GROUNDWATER

The maximum and average radionuclide activities are shown in Figures 3-1 through 3-4 of the DP. However, a description of the radionuclide activities in each of the aquifers is not adequately described. The magnitude and extent of uranium activities in groundwater, including the maximum and average uranium activities, and the recoverable amount of uranium in the aquifer in the BA-1 and the western area should be addressed in the DP.

SECTION 5.6.11: LAND USE

The licensee stated (DP 5.6.11; Radiation Protection Plan (RPP) 6.9) that its annual administrative ALARA goal is 100 mrem TEDE. Please describe how this goal is verified as the workplace air sampling program triggers are significantly higher than this value.

SECTION 8.6: IN-PROCESS MONITORING

Monitoring groundwater treatment progress is discussed by the licensee (DP 8.6, 15.3). Please provide an analysis by the licensee demonstrating that discharges are in accordance with the OPDES Discharge Permit and meet the requirement of 10 CFR 20.2001. This would include an analysis based on enriched uranium and the unity rule, taking Tc-99 into account. Please include a discussion of Tc-99 related to discharges into the Cimarron River.

Please provide an analysis that demonstrates effluent discharges are in compliance with 10 CFR 20.2001 or identify where this demonstration is in the application.

SECTION: 11: RADIATION PROTECTION PROGRAM

In Section 11 of the DP, the licensee referred to the RPP as Appendix O. However, Appendix O is titled *Criticality and Uranium Loading Calculations*. The RPP is located in Appendix N. Please explain how this will be corrected and make the correction.

SECTION 11.1: AIR SAMPLING PROGRAM

1) The licensee stated (DP 11.1; RPP 10.1, 10.6): "*U.S. NRC Regulatory Guide 8.25*, "Air Sampling in the Workplace *provides an acceptable method for meeting certain survey and dose assessment requirements of 10 CFR 20. Air samples shall be collected whenever the airborne radioactivity levels are expected to exceed 10 percent of the Derived Air Concentration (DAC) as listed in Appendix B, Table 1 "Occupational" of 10 CFR 20."*

Please provide a description of how airborne radioactivity levels are estimated (e.g., Section 1 of NUREG-1400, and Regulatory Position 1.1 and Table 1 of Regulatory Guide 8.25).

2) RG 8.25, Table 1, recommends air sampling when the airborne radioactivity levels are expected to exceed 1 percent of the DAC for a worker with an estimated intake less than 10 percent of the applicable annual limit of intake (ALI).

Please provide the technical basis for using 10 percent of the DAC as a trigger for air sampling.

SECTION 11.2: RESPIRATORY PROTECTION

The respiratory protection triggers (DP 11.2; RPP 14) appear undefined, and potentially too high, as the licensee has not discussed compliance with 10 CFR 20.1201(e) for soluble uranium (if applicable) at the site (see Workplace Air Sampling Program, (2) above). Also, there is no discussion of the details of a potential future respiratory protection program (i.e., consistent with RG 8.15, NUREG/CR-0041, etc.).

Please address respiratory protection triggers and a description of a potential respiratory protection program as discussed above.

SECTION 11.3: INTERNAL EXPOSURE DETERMINATION

1) The licensee stated (DP 11.3): "Bioassay sampling will also be performed whenever it is likely that an individual may have received an intake of 10 milligrams of uranium in any one week." Please describe how compliance with the weekly intake of soluble uranium is determined by measurements of airborne radioactive materials.

2) The licensee did not provide (DP 11.3, 11.5; RPP 6.7, 6.8) a description of how the internal dose to an embryo/fetus will be determined.

Please provide a description of how the internal dose to an embryo/fetus will be determined or provide NRC staff with a description of where this information is located in the application.

3) The licensee stated (DP 11.3): “In addition to the requirements set forth in the RPP, RP procedures include requirements for how worker intakes are determined...”

Consistent with NUREG-1757, Vol.1, Rev. 2, Section 17.3.1.3, please provide the NRC staff with information regarding how worker intakes are determined including how airborne concentrations are converted to determine intake, etc.

SECTION 11.4: EXTERNAL EXPOSURE DETERMINATION

The licensee stated (DP 11.4): “...RP procedures describe the type, range, sensitivity, and accuracy of required of individual-monitoring devices. RP procedures also include a description of the action levels for worker’s external exposure, and the technical bases and actions to be taken when they are exceeded.”

Consistent with NUREG-1757, Vol.1, Rev. 2, Section 17.3.1.4, please provide the NRC staff with information regarding the type, range, sensitivity, and accuracy of each individual-monitoring device and a description of the action levels for workers’ external exposure, and the technical bases and actions to be taken when they are exceeded.

SECTION 11.5: SUMMATION OF INTERNAL AND EXTERNAL EXPOSURE

The licensee stated (DP 11.5; RPP 6.1) that internal monitoring is required for “...any declared pregnant worker who is likely to receive during the entire pregnancy, a committed effective dose equivalent exceeding 0.1 rem.”

10 CFR 20.1208 specifies the maximum dose equivalent to the embryo/fetus. It is not clear how the committed effective dose equivalent to the pregnant worker is related to the dose equivalent to the embryo/fetus. Please provide a description of how workplace monitoring for a declared pregnant worker is determined that takes the dose equivalent to the embryo/fetus into account.

SECTION 11.6: CONTAMINATION AND CONTROL PROGRAM

The licensee provided a description of its contamination control program (DP 11.6, RPP 10.2-10.4, 12, 13).
Please provide the following information: 1) A description (e.g., maps) of restricted areas established at site, and 2) the types and frequencies of contamination surveys for restricted and contaminated areas (NUREG-1757, Section 17.3.1.6 suggests a matrix or tabular form).

SECTION 11.7: INSTRUMENT PROGRAM

The licensee provided a description of its instrument program (DP 11.7; RPP 7).

Please provide the following information:

1) A description of the method used to estimate Minimal detectable concentration (MDC) or Minimal detectable activity (MDA) (at 95% confidence level) for each type of radiation to be detected and expected radionuclide mixtures (i.e., provide a specific calculation methodology taking into account surface efficiency, etc.). A reference to a desk instruction is not sufficient. See, for example, NRC discussion of minimum detectable concentrations in ADAMS Accession Nos. ML18072A029 and ML15295A045,

2) A description of instrument storage, calibration, and maintenance facilities for instruments used in field surveys, including onsite facilities used for laboratory analyses of samples collected during surveys. A reference to a desk instruction is not sufficient,

3) Section 7.4 of the RPP provides quality assurance (QA) procedures for laboratory instrumentation. Please provide QA procedures for other instruments used in the radiation protection program. A reference to a desk instruction is not sufficient.

SECTION 11.9: HEALTH PHYSICS AUDITS, INSPECTIONS, AND RECORDKEEPING

The licensee provided a description of its Health Physics Audits and Recordkeeping program (DP 11.9; RPP 5).

However, there are no details of the Health Physics Audits and Recordkeeping Program in Section 11.9 of the DP or Section 5 of the RPP. The licensee should provide information consistent with the guidance in Section 17.3.3 of NUREG-1757, Vol. 1, Rev. 2. In addition, the licensee should submit its Quality Assurance Program Plan (QAPP) as part of its application.

SECTION 12: ENVIRONMENTAL MONITORING AND CONTROL

General Comment:

If information relied on for compliance with NRC regulations is contained in procedures or other references (as opposed to the DP itself), it is important to include specific revision numbers for the documents. If a key document has multiple revisions, it can cause confusion in the implementation of the DP, particularly if there is turn over in site staff. It can also lead to the site and the NRC inspectors not having a common understanding of what the licensee is committed to doing. One example of such a document is the RPP. The DP contains a draft version of a revision to this document, but the final version is not provided, and a specific revision number does not appear to be cited in the DP. Please provide the final RPP

SECTION 12.1: ENVIRONMENTAL ALARA EVALUATION

Section 17.4.1 of NUREG-1757 Vol. 1 Rev. 2 described the information to be provided in a decommissioning plan for the environmental ALARA evaluation program, but the DP does not appear to contain all the requested information.

- The DP does not appear to include a description of the ALARA goals for effluent control.
- The DP also does not appear to include a detailed description of the procedures, engineering controls, and process controls to maintain doses ALARA.
- Section 12.1 of the DP refers to the RPP, but the RPP does not appear to have the above noted information either. Additionally, the RPP refers to RP-10 "ALARA Program" as describing how the ALARA program will be implemented. If the information in RP-10 is intended to be used to demonstrate compliance with NRC regulations, it should be provided to the NRC staff and the RPP should cite a particular revision number.

SECTION 12.2: EFFLUENT MONITORING

Section 17.4.2 of NUREG-1757 Vol. 1 Rev. 2 described the information to be provided in a decommissioning plan on the effluent monitoring program for the NRC staff to be able to fully understand how the effluent monitoring program will be implemented and conducted. The DP does not appear to contain all of the requested information.

- Section 12.2 includes information on the expected maximum concentration of uranium (i.e., the MCL), but it does not include information on the concentration of other radionuclides and whether any other radionuclides are present at levels above background.
- A justification that the sample ports provide representative samples was not provided.
- Section 12.2 does not include a description of the environmental monitoring recording and reporting procedures.
- The description of the quality assurance program for effluent monitoring in Section 12.2 is minimal.

SECTION 12.3: EFFLUENT CONTROL

Section 17.4.3 of NUREG-1757 Vol. 1 Rev. 2 described the information to be provided in a decommissioning plan for the effluent control. The DP does not appear to contain all of the requested information.

- Section 12.2 does not appear to contain a summary of the action levels and a description of the actions to be taken if a limit is exceeded.

- Section 12.2 does not appear to include a summary of the estimates of doses to the public from effluents and a description of the method used to estimate these public doses per 10 CFR 20.1302. This estimation of doses should account for all radionuclides that are present above background. Note this is related to a previous comment on Section 8.6.

SECTION 13.1: SOLID RADIOACTIVE WASTE

Section 17.5.1 of NUREG-1757 Vol. 1 Rev. 2 described the information to be provided in a decommissioning plan related to solid radioactive waste. However, the following information does not appear to be in the DP:

- Section 13.1 of the DP provided some information on limits for the concentration of U-235 in the resin. However, the expected concentrations and other radionuclides in the resin is not provided. Additionally, Section 13.1 and Section 5 note that the resin will be blended to meet the disposal facility waste acceptance criteria (WAC). It is not clear what criteria in the WAC this blending is being performed to meet (e.g., homogenization or to meet concentration limits).
- The DP does not appear to include the expected volumes of contaminated materials such as gloves, disposable sampling devices or contaminated piping or equipment that will be generated. The DP also does not appear to have information on the approximate expected concentrations of radionuclides on this waste.
- The DP does not address if any volumetrically contaminated waste is expected.
- The DP does not seem to contain the name and location of the disposal facility that the licensee intends to use for each solid radioactive waste type. CERTs prior response to RAI EA-10 indicates that this information will be contained in Sections 8.3.1, 8.3.2, 8.4.3, 8.6.3, and 8.6.5, but this information does not appear to be in these sections either. The NRC staff wants to know whether there is a contractual obligation for a recipient of the solid radioactive waste.

RADIATION PROTECTION PLAN

General Comment

Throughout the RPP, the licensee used the term "RSO or designee". Please provide the qualifications of the designee (e.g., a qualified health physicist).

1) The licensee stated (RPP 10.1): “If air sample data indicates a measured level greater than 40 DAC-hours in any shift or operation, whichever is shorter in time duration, the RSO or designee shall conduct an investigation and take corrective actions to reduce airborne contamination levels.”

The values for Derived Air Concentration (DAC) in 10 CFR Part 20, Appendix B, Table 1, are derived for various radionuclides and their translocation classification (D, W, or Y).

Please provide the DAC values, and their technical bases, for determining compliance with 10 CFR Part 20.

Please discuss how compliance is assessed against 10 CFR 20.1201(e) for soluble uranium.

2) The licensee stated (RPP 10.1): “Air sample collection media shall be appropriate to address the radionuclide mixture(s) present.”

Please provide the expected radionuclide mixtures and the air sampling media to be used.

Please discuss how internal exposure is determined for mixtures of radionuclides (10 CFR 20.1204(g)).

3) The licensee stated (RPP 10.6.5): “Action levels will be developed that will include specific action levels (i.e., specific projected or actual airborne radioactive material concentration levels) for assigning respiratory protection, collecting bioassay samples, and stopping work.”

Please provide a list of all airborne action levels developed, actions taken when they are exceeded, and their technical bases.

4) The licensee stated (RPP 10.6.6): “Minimum detectable activities (MDAs) based on various sample count times will be calculated and used to determine the sample volume needed to detect less than 10% DAC for 4% enriched uranium.”

Please provide the methodology for calculating the MDA for airborne samples as well as the MDA for each specific radionuclide that may be collected in air samples. Please also address how the potential for the burial of radionuclides within the filter media is assessed when determining filter efficiency (refer to NUREG-1400, “Air Sampling in the Workplace”, Section 6.2).

External Exposure Determination

The licensee stated (RPP 6.1): “Area radiation monitoring was established (see Section 10.5 of the RPP) to confirm the results of this evaluation.”

Please provide the NRC staff a summary of area radiation monitoring results since 2006.

Summation of Internal and External Exposures

`The licensee stated (RPP 6.1): “Personnel monitoring has not been performed since 2006 because there was no potential to receive a dose that would require monitoring under 10 CFR 20.1502. During the design of groundwater extraction and treatment systems, new work activities, such as groundwater processing, were evaluated to determine if they may result in exposure requiring personnel monitoring.”

Please provide the analysis that resulted in this conclusion and whether this analysis is current.

Facility Radiation Surveys

Release Criteria

The licensee stated (RPP 13.3) that "...surveys will be performed and documented by qualified individuals."

Please provide the qualifications of a "qualified individual".