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Sent: Wednesday, October 23, 2013 5:45 PM
To: Jacobs, Sara
Cc: 'trombadore.claire@epa.gov'; Wetmore, Cynthia; Janet Brooks; 'gilmore.cathy@epa.gov'; Chang, Lydia; Norman, Yolande; Hauer, Lance M (GE, Corporate); randall.mcalister@ge.com; 'phyllis.bustamante@state.nm.us'; Dixon, Earle, NMENV; 'Eugene Esplain'; freidawhite@navajo-nsn.gov; mroanhorse@frontiernet.net; Shafer, David; Gil, April; Kleinrath, Art
Subject: DOE Final Comments on Reports, Redline Final AP Vol I – PreDesign Study plan Mill Site and Redline Final SAP Vol I – PreDesign Study Plan Mine Site, and Acknowledgement of U.S. EPA Request to DOE Regarding Design Review
Attachments: DRAFT DOE Feedback on NECR Pre-design Studies 6sep13.pdf; 10-23-13 NECR PreDesign Study Plans (Jacobs).pdf

Dear Ms. Jacobs:

Please find attached U.S. Department of Energy's (DOE's) final comments on the subject reports as well as acknowledgement of U.S. Environmental Protection Agency's (EPA's) recent request for DOE to coordinate comments on future documents through the U.S. Nuclear Regulatory Commission. This feedback is provided in response to a 2011 request from EPA and NRC for DOE to participate in an interagency work group to review the design of a proposed repository which will contain waste from the Northeast Church Rock Mine Site at the Church Rock UMTRCA Title II Disposal Site (Church Rock site).

DOE appreciates EPA's continued interest in DOE's participation in the interagency work group as we will eventually become responsible for long-term surveillance and maintenance at the Church Rock site in accordance with the Uranium Mill Tailings Radiation Control Act of 1978.

Best regards,

Deb

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DRAFT DOE Comments on Northeast Church Rock Mine Site Removal Action Pre-Design Studies

The U.S. Department of Energy (DOE) offers the following draft comments on pre-design studies reports associated with the Northeast Church Rock (NECR) mine site removal action which were submitted to DOE on August 16, 2013. The comments are provided in response to requests from the U.S. Environmental Protection Agency (EPA) and the U.S. Nuclear Regulatory Commission (NRC) for DOE to participate in an interagency work group to review the design of a proposed repository to contain waste from the NECR mine site at the United Nuclear Corporation Church Rock mill site. DOE is submitting these in advance of interagency and design work group meetings which are scheduled September 10–11, 2013, at the request of EPA.

Draft comments for consideration are based on the assumptions that: 1) the proposed repository will be designed and constructed in accordance with NRC regulations and guidance, including NUREG-1620, *Standard Review Plan for the Review of a Reclamation Plan for Mill Tailings Sites Under Title II of the Uranium Mill Tailings Radiation Control Act of 1978*, and 2) an evapotranspiration (ET) cover system to manage water balance will be constructed. Additionally, DOE notes that the pre-design studies specify a geotechnical evaluation of the existing tailings cover at the Church Rock mill site will be conducted to determine the feasibility of using the cover as a low-permeability layer (or liner) at the base of the proposed repository. DOE maintains its concern regarding the use of a liner. Specifically, we are concerned about the possible accumulation of leachate and the lateral flow of fluid over time and the need to install a leachate control system after the site is transferred to DOE. DOE will perform long-term maintenance and surveillance at the site as specified in Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA) and its accompanying regulations.

Northeast Church Rock Mine Site Removal Action Pre-Design Studies Work Plan, Church Rock Mill Site

Specific Comments

1. Sections 1.2.1 & 1.6: Section 1.2.1 of the report states approximately 870,000 cubic yards (cy) of mine spoils and debris will be removed from the NECR mine site and consolidated into a new repository at the Church Rock mill site as specified in EPA's *Action Memorandum: Request for a Non-Time Critical Removal Action at the Northeast Church Rock Mine Site* (Action Memo) released in September 2011. However, DOE believes the Action Memo also indicates an additional 139,800 cubic yards of material will be removed. If DOE's understanding of the Action Memo is correct, approximately 1 million cy of material from the NECR mine site will be placed in the proposed repository. DOE requests clarification on whether the +/- 20 percent volume contingency specified in Section 1.6 is based on the estimate of 870,000 cy or 1 million cy of material. DOE is concerned that the 20 percent contingency may be exceeded and additional, unanticipated waste could expand the footprint area of the proposed repository which the existing pre-design studies work plan may not address. Is there an additional contingency in place if the 20 percent contingency is exceeded?

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2. Section 2.2.4

- a. 2nd Paragraph: Characterizing soil hydraulic properties of analog soil profiles is important. Because it is necessary to understand soil structure as structural planes and fissures can form over time. The establishment of soil structure in an ET cover may influence its performance with respect to radon flux. Will data also be collected which can be used to evaluate possible long-term changes in radon diffusion and flux?
- b. 2nd Paragraph: Obtaining information about past land use at natural analog areas would help validate whether soils and vegetation are undisturbed.
- c. 3rd Paragraph: The report states that “a tension infiltrometer or similar instrumentation” will be used. As possible alternative instrumentation to the tension infiltrometer which will allow measurement of in situ soil properties, DOE suggests considering the use of undisturbed block sampling and laboratory analysis. An example follows.

Block samples would be collected by hand-trimming large intact soil pedestals following the procedure in ASTM D 7015. The larger than normal ring diameter would ensure that pedogenic features are included in the sample. All samples would be sealed for transportation to the lab. Test specimens would be trimmed from the block samples for testing in flexible-wall permeameters using the falling headwater rising tailwater procedure in ASTM D 5084. After the completion of hydraulic conductivity tests, soil water characteristic curves (SWCCs) would be measured on the test specimens following the procedures in ASTM D 6836. A pressure plate would be used to determine the wet end values of the SWCC and a chilled mirror hygrometer would be used to determine the dry end values.

3. Section 2.2.4 & 2.2.6: Please clarify whether the natural and vegetation analog areas are the same as those proposed for the borrow materials investigation (Section 3.1.2). If the samples used for the analog areas assessment are the same as those specified in 3.1.2, the tests and methods are thorough and appropriate as agronomic and edaphic properties will be determined. However, if the samples used for the analog areas assessment are different (even if taken from nearby areas), DOE requests that consideration be given to fully characterizing those samples as well, to include the testing of agronomic and edaphic properties. Soils from nearby areas may differ. The usefulness of data will depend on how similar the analog soils are to soils used for the proposed repository cover.
4. Section 2.2.9: If an aerial topographic survey is performed, would a survey of the entire area of the existing disposal cells be conducted? This could help establish a baseline to assess potential future settlement and erosion.
5. Section 3.1.1.1 & Table 3-3: This section and table specify testing to be conducted on the cover materials associated with the existing tailings cover at the Church Rock mill site. As suggested on the supplemental data needs report, DOE still believes it necessary to test for agronomic and edaphic properties. DOE requests that reconsideration be given to

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testing for these properties, as agronomic and edaphic properties of the admixture soils may also have changed over time (e.g., leaching may have modified the chemical composition, organic matter may have accumulated). Although the soil portion of the admixture was derived from known borrow areas, the admixture has been in place on the existing cells for a period of time. Additionally, it is not known whether the original source of the admixture was topsoils or subsoils, and properties of these two sources can be different. If admixture soils are potentially used in an ET cover, it would still be of benefit to test these soils in the same manner as the borrow soils to allow for full characterization.

6. Section 3.1.1.2 (item #3): DOE suggests consideration be given to specifying a standard penetration speed for cone penetration test (CPT) soundings at 2 cm/sec. Additionally, continuous observations and records of all sounding readouts would provide more complete data than observations only at specified intervals.
7. Section 3.1.4 (item #2): The report states that tentative depths for tension infiltrometer measurements of the proposed borrow soil material(s) are 1, 2, and 3 feet below surface. Will the established depths correspond to the full range of possible soil sponge layer depths in an ET cover if it is proposed? Changes in soil morphology can occur at depths below 3 feet. It would be useful to have data for depths further below the surface if a soil sponge layer thicker than 3 feet is proposed in order to better predict its overall effectiveness.
8. Section 3.1.1.3 (item #7): This section states that an alternative may be to conduct geotechnical testing onsite which would not require taking the samples offsite. If this alternative is developed, DOE requests the opportunity to review any supporting documents further describing this option.
9. Section 3.6: The pre-design studies work plan associated with the mine site describes a laboratory analytical program to be used for the analysis of surface and subsurface soil samples. This includes identifying soil analytical methods (Section 2.4.2), geotechnical analysis standards (Section 2.4.3), and the laboratories which will conduct the analyses (Section 2.4.5). DOE suggests consideration be given to including a similar level of detail, or analytic program, in the pre-design studies work plan for the mill site. The geotechnical testing laboratory used for the analysis will need to be a licensed or permitted to handle radioactive materials.

General Comments

1. Sections 2.2 and 3.0 address previous DOE comments on the supplemental data needs report regarding cover soil edaphic properties, natural analogs, revegetation plans, success criteria and monitoring metrics, and biointrusion. DOE's comments were addressed. Including these items in the pre-design studies and using the results to inform the design of a new repository cover will increase the likelihood of the repository being more sustainable for the long-term.

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2. DOE suggests considering electrical resistivity cone penetration testing (RCPT). RCPT would produce a more comprehensive set of data than CPT, including relative moisture content. An RCPT combines downhole analysis of soil resistivity with piezocone penetration testing to provide real time estimates of soil stratigraphy, permeability and strength. The electrical resistivity provides relative moisture contents if the tool is uncalibrated for specific tailings, or absolute moisture contents if the resistivity piezocone is calibrated for the tailings.

Observations

1. Section 1.5: The 8th bullet states that ground water concentrations shall not exceed remediation goals set in EPA's 1988 ROD for a Ground Water Operable Unit (to include any potential ROD amendments) for the proposed waste repository at the Church Rock mill site. It is not understood whether the design will also take into consideration standards set in accordance with 40 CFR 192 which also apply at the mill site.
2. Section 2.2.1.2 (item #2, pg. 7): Is it intended that three CPT soundings, rather than two, are proposed in Burrow Pit No. 1? Section 3.1.1.2 as well as Figures 3-1 and 3-2 state three CPT soundings will be located in or near Burrow Pit No. 1.
3. Section 3.1.1.3 (item #7): This section references Table 5-1 and Table 5-2, but tables with these numbers were not found in the report.

Northeast Church Rock Mine Site Removal Action Pre-Design Studies Work Plan, Northeast Church Rock Mine Site

Specific Comments

1. Section 2.1.2: Will a linear relationship between the existing borehole and a new hole to establish where principal threat waste (PTW) material may be found be delineated, or will another method be used (e.g., assuming the extent of PTW ends at half way between the two holes)?
2. Section 2.1.4: DOE requests assurance that if suspect waste (odors, discolored, broken batteries, transformers, etc.) is discovered during sampling or excavation of mine waste materials that a process is established to further sample the suspect material to determine if RCRA hazardous waste is present.
3. Section 2.2.4: If sampling for radium-226 occurs every 5 feet, it is unclear how the depth of contamination will be determined with a fair amount of accuracy. DOE believes the depth needs to be determined with precision to help estimate the volume of material as well as the dimensions of the proposed repository. Downhole logging has proved to be a useful tool to delineate contaminated soils and was successfully used by the DOE to characterize 4000 vicinity properties. DOE has established procedures for using Eberline and Bicon gamma-ray detectors and published papers, such as the Technical Measurement Center Report-GJ/TMC-03(82), on the use of the detectors for downhole total count logging.