State of Utah

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Department of
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Kimberly D. Shelley
Executive Director

DIVISION OF WASTE MANAGEMENT
AND RADIATION CONTROL

Douglas J. Hansen
Director

December 19, 2022

Vern C. Rogers, Director of Regulatory Affairs
Energy*Solutions*, LLC
299 South Main Street, Suite 1700
Salt Lake City, UT 84111

RE: Federal Cell Facility Application Requests for Information

Dear Mr. Rogers:

The Division of Waste Management and Radiation Control hereby provides Requests for Information (RFI) regarding the Federal Cell Facility Application dated August 4, 2022. Each individual paragraph in the attached document is numbered and represents an issue discovered in a review of the application and its appendices. When responding to an RFI, please use the assigned number representing each question. The Division will track all responses and provide regular updated information to the public and reviewers.

The current review does not represent a comprehensive evaluation of the Application's merit and additional RFI's will follow where appropriate.

If you have any questions regarding this letter, please call Otis Willoughby at (801) 536-0220.

Sincerely,

Douglas J. Hansen, Director
Division of Waste Management and Radiation Control

DJH/OHW/wa

Enclosure: Federal Cell Application Review, Request for Information or Updates to the Application (RFI) (DRC-2022-024035)

c: Jeff Coombs, EHS, Health Officer, Tooele County Health Department
Bryan Slade, Environmental Health Director, Tooele County Health Department Energy*Solutions*
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Federal Cell Application Review

Request for Information or Updates to the Application (RFI)

General

- Each of the RFI's has been assigned an identifier with a numbering convention as follows-
    - Application/Appendix Section
        - Section/Appendix Subsection
            - Section/Appendix Subsubsection (when applicable)
                - Sequential numbering

Example: A question in Section 1, subsection 1, subsubsection 1 -The first RFI # would be 1.1.1-1, the next question in that section/subsection would be numbered 1.1.1-2

Please refer to the assigned RFI number when submitting a response.

Appendix O: Erosion Modeling

- **O-2**

  After downloading SIBERIA from the public website, it did not compile, it may be because it has not been revised for modern architecture. The Division requests that Energy*Solutions* please provide: (1) Information pertaining to the operating system on which the SIBERIA code was run, (2) Information pertaining to the complier used to compile the SIBERIA source code, (3) SIBERIA compiled version of the code currently being run to support Clive DU PA v2.0, and (4) SIBERIA source code currently being run to support Clive DU PA v2.0. These will greatly expedite our review of the erosion modeling.

- **O-3**

  In order to conduct an independent review on the SIBERIA modeling, please provide the SIBERIA input/output files used for the Clive DU PA v2.0.

- **O-4**

  A single value is specified for many of the parameter values input to SIBERIA that are uncertain. For example, NUREG/CR-7200 explores a range of values of n1 and m1. Whereas Clive DU PA v2.0 uses one set of n1 and m1 values and a very limited range of beta1 values. Please conduct a quantitative sensitivity analysis on the parameters that are most uncertain and that the results are most sensitive to.

- **O-5**

  NUREG/CR-7200 discusses how a SIBERIA model is calibrated using regressions of beta1, m1, and n1 values. Please describe quantitatively how the SIBERIA model was calibrated to measured data for the Clive DU PA v2.0.

- **O-6**

  Some parameters can be grid resolution dependent (e.g., the hillslope diffusivity parameter). Please describe whether any grid convergence testing was performed and, if not, how the grid spacing in the SIBERIA model was determined to be sufficiently small.

- **O-7**

  The DU PA v2.0 uses a mean flow in the analysis but refers to threshold flow. Somewhat outdated literature is cited in this discussion. Thresholds are important in gully formation and considering the full distribution of events, particularly events of significance changes as the landscape changes. Please clarify the role of mean flow assumptions versus threshold in the SIBERIA modeling.

- **O-8**

  It is unclear whether a roughness value for the initial topography was assigned in the SIBERIA model. Formation of rills/gullies often require some roughness to initiate (otherwise the channelization process has a hard time initiating). Please clarify whether a roughness value was assigned in the initial topography, and if not, provide the justification for not including the roughness and if it was included, please justify the assigned value.

Appendix D: Geotechnical and Seismic Engineering Evaluations

- **D-2**

  Evaluate Uncertainty in Engineering Properties**.** The geotechnical analyses presented in Appendix D as a basis for the proposed Federal Cell have evaluated expected conditions using engineering properties obtained during past geotechnical explorations at the site and from the literature. Geotechnical properties are inherently spatially variable, and the spatial variability will affect the outcomes of the analyses. Understanding the impact of spatial variability on geotechnical stability is necessary to evaluate the efficacy of the Federal Cell. The Division requests a quantitative evaluation of the sensitivity of each of the geotechnical analyses to uncertainty in the engineering properties by varying the engineering properties used in the analyses two standard deviations above and below the mean.

- **D-3**

  Evaluate Static and Seismic Stability of Internal Slopes**.** The geotechnical analyses in Appendix D have been conducted in the context of global stability using the build out geometry. Case histories have shown, however, that stability failures in waste containment systems often occur within internal slopes during operations (e.g., during filling). The potential for internal slope failures needs to be evaluated, and any vulnerable internal slope geometries identified. Please evaluate quantitatively the static stability of a range of likely scenarios for internal slopes. Identify critical internal slopes geometries, if any, that are prone to stability failure.

- **D-4**

  Evaluate Blow Counts Using Appropriate Hammer Correction Factor and Re-evaluate Geotechnical Analyses. The standard penetration testing (SPT) hammer correction factor used to adjust the blow count data may not have been appropriate for the hammer used for the geotechnical exploration activities. Determine the type of hammer (specifically that of a rope and cathead or one using an automatic system) used for standard penetration testing in the past geotechnical exploration activities and the appropriate hammer correction factor to be used to adjust the blow counts for the hammer that was employed. If necessary, re-compute the blow counts used in the analyses and re-conduct the geotechnical analyses using blow counts updated with a revised hammer correction factor. In addition, if geotechnical parameters were developed from empirical relationships using SPT blow counts, confirm the appropriate SPT blow counts were utilized in developing those geotechnical parameters.